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# Computer Weekly

Thursday, December 15/22, 1983

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## Group sets up to fight the pirates

by George Black  
A FEDERATION against software theft is to be set up to campaign for amending copyright law to cover software and to press for stiffer penalties against piracy.

The federation will have the support of a number of leading manufacturers, including IBM, ICL and LMS, as well as several trade bodies, such as the British Computer Society, National Computing Centre and Computer Trade Association.

They voted unanimously at a copyright committee meeting of the BCS last week to band together in a move to set the law straight and bring penalties in line with those now imposed on video pirates. Leading figures in the new federation will meet members of Picom, the parliamentary information technology committee, in the New Year for talks on the chances of getting a Private Member's Bill introduced.

Behind last week's development lies the idea of bringing in a simple, single-clause Bill amending the 1956 Copyright Act, to make the term "literary work" include computer programs and the term "writing" include input and output.

Two and a half years ago a government Green Paper recommended major changes in legislation, but these have been postponed pending a broad review of the whole field. The BCS committee argues that programs are in fact already covered by the existing law, but that the public either does not understand this or is not deterred from theft by light penalties.

A Private Member's Bill, supported by the government, was carried successfully in July amending the penalties for video piracy. Conviction for criminal offences, involving video piracy, under the Copyright Act can now lead to fines up to £2,000 and imprisonment for two years. But all other sorts of breach of the Act, including software piracy, still have a £50 fine limit.

An official of the Department of Trade and Industry said that the law limit on fines for software offences meant that few writers of programs had thought it worthwhile to bring cases to court. More often they had simply moved into a new field of development in search of greater rewards.

"The government obviously realises there is a problem in that the Act is not specific about software. There are various proposals under consideration, but it is very complicated," he said.

Chairman of the Computing Services Association's legal group, Ronald Robertson, said the aim of the newly-formed action group would be to persuade MPs of the need for changing the law.

"We have to give them examples of how companies, sometimes in their own constituencies, are suffering from theft of programs," he said. "We must educate the marketplace at large. It is crucial to overcome the attitude that seems to be developing that there is nothing wrong with copying someone else's software."



ROBERTS... "The transporter will be an interesting addition."

## Cash-rich GEC talks to Inmos

by Dave Madden  
UK electronics giant GEC this week revealed that it holds £1.5 billion in cash, shortly after confirming that it is talking to Inmos with a view to buying the state-owned micro-maker.

Both companies admit that talks have started, but GEC is not the only corporation interested in taking a stake in Inmos, and no decision as to Inmos' fate is imminent.

GEC's renewed interest in Inmos represents an about-turn. The company waived a chance to take Inmos on in 1980. Now Derek Roberts, GEC's director of research has said that enough had changed since then - both within Inmos and its marketplace - to make another look worthwhile.

Roberts' view is that despite its parlous financial state, Inmos has made a lot of progress, while the transporter, "if they can deliver it, and it performs as they predict, will be a very interesting addition," he said.

GEC is not the only suitor, and according to one commentator, it is not the favourite either. Inmos reported to be speaking to several other companies - including Philips, SGS of Italy, and AT&T Western Electric in the US.

One possibility is that a multinational corporation might take a minority stake in the company along the lines of the IBM/Intel deal - which would give Inmos capital to work with, and at the same time, put a price on the company.

It could still go ahead with plans for flotation either in the UK, or both the UK and the US, in the medium term.

Such a strategy would presumably exclude GEC which has no history of making equity investment in small companies, as opposed to acquiring research units.

Speculation about a link with Inmos has enlivened GEC's otherwise uninspiring interim figures.

Pre-tax profits for the six months to September 30, were down from £281 million this time last year to £285 million, on turnover of slightly over £2.612 billion.

## Two face trial after PDP seizure

by George Black  
TWO men could be committed for trial in January for allegedly trying to export DEC PDP-11 minicomputers to Czechoslovakia.

They are the directors of a small company at Ferndown, near Wimborne in Dorset, called Dstalec. Bryan Williamson of Ringwood, Hampshire, and Christopher Carrance of Basingstoke, near Bournemouth, were remanded by Poole magistrates on Monday on bail of a £6,000 surety each. Their passports have been confiscated.

John Cassey, of the Customs and Excise special investigating division, told magistrates that the offence was said to have occurred on or about December 11, when six PDP-11/34s and PDP-11/44s, valued at around £500,000, had been intercepted at Poole docks. He said they were bound for Czechoslovakia and thence to Czechoslovakia.

The two men are charged with contravening the Export of Goods Control Order of 1981 in attempting to export the machines illegally with spares and "add-ons".

Committal proceedings are expected on January 24. But it could take three months for the case to reach a crown court trial, as requested by the Customs department.

The PDP-11 was first made in 1970, but DEC says it cannot get export licences to distribute it in Czechoslovakia.

Last week US commerce secretary Malcolm Baldrige criticised the scope of the list of restricted technology drawn up by NATO's co-ordinating committee, Co-com, as being out of date.

Checks on the flow of computers have been stepped up in recent months in the wake of the US government's Operation Exodus initiative, to stop the Soviet Bloc getting American-made technology for military use. Earlier this year a consignment was halted at Dover docks, believed to have contained a Vax but labelled as "typewriting equipment". Other consignments have been seized in West Germany and Sweden.

## ... while DEC keeps in bond

by John Riley  
DIGITAL EQUIPMENT is using TWO men to keep its kit in bond in Scotland, and save £500,000 a year. The new system allows it to take advantage of three different Customs import relief schemes at once.

The system, written by UK software and systems house Computer Management Group, means that DEC can now avoid tying up cash by paying duty when components are imported for assembly in the UK, and then claiming a refund when it re-exports them in finished products.

The original specification was produced by DEC, and CMG wrote the software in a deal worth around £200,000. The software, which is written in Cobol for DEC's VMS operating system, took a year to produce. The system keeps track of imported components at all times, conforms to Customs' formats and can communicate via magnetic tapes with the Customs' main computer at Southend.

The system, to be implemented by DEC at its plant in Ayr, combines three systems: period entry imports system; franchise warehouse system; and import duty relief system.



HEALY... "We will be setting up in the New Year."

## Osborne is reborn in US

by Niall Moran  
THE Osborne Computer Corporation in the US is to be reborn next month.

And Osborne in the UK is proceeding with its plans to go independent. Mike Healy, UK managing director, said: "We will be setting up in the New Year with Osborne in the US taking a minority holding."

"The creditors committee, banks and courts have given their approval to a plan for restructuring and relaunching the US company, which filed for bankruptcy in September."

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## AT&T takes 20% stake in Olivetti group

by Dave Madden  
AMERICAN Telephone & Telegraph is set to take a 25% stake in the Olivetti group for around \$260 million. The companies have signed a nine year agreement, and AT&T has an option to increase its interest to 40% after four years.

Apart from a substantial cash injection the venture brings AT&T technology to Olivetti, whilst AT&T gets access to Olivetti's European marketing organisation.

Olivetti will market and may eventually manufacture AT&T equipment in Europe. An AT&T spokesman said that this would include AT&T's Dimension range of private switches, telephone and teletype equipment, microcomputers, terminals and software such as the Unix operating system.

Olivetti has long been looking for an effective marketing organisation in the US, and the promise of using AT&T's distribution channels must have been the biggest attraction for Olivetti of the deal.

AT&T has agreed to take \$250 million worth of Olivetti kit in the first year of the venture. But AT&T insisted that any specific marketing arrangements in the US had still to be negotiated - and no decision is likely before mid-1984.

Olivetti's president, Carlo de Benedetti, announcing the link in Rome, said: "Olivetti is now an established European leader in this field - but there is an increasing need for global co-operation in the Information Technology industry. Only a few companies will survive, and Olivetti will be one of them."

James Olsen, chairman of AT&T Technologies, said that the deal was a major advance, combining "the unique strengths and skills of two industry leaders". He expected the new venture to have a "pivotal role" in world office automation and described Olivetti as "the ideal partner".

AT&T insisted that the deal would not affect its joint venture with Philips, as that covered public switching and transmission, whilst the Olivetti venture was only concerned with end user products and technology.

But the move may compromise Olivetti's relationship with Northern Telecom - at the moment it sells the Canadian company's SL1 PABX, which competes directly with AT&T equipment.

Industry gossip has linked AT&T and Olivetti for several months, and the speculation has driven up Olivetti shares in Milan by about 15%. Rumours were encouraged by the news in November that the French government's CIT/Alcatel had reduced its stake in Olivetti from 32.4% to 10%.

The remaining 22.4% held previously by Saint Gobain and Cidec Machines Bull, returned to Olivetti, and purchased by companies linked with Benedetti.

■ Leader comment - page 17



DE BENEDETTI... Co-operation.



TEBBIT... Is there a note of desperation in his plan?

## Unions scorn Tebbit's plan

by George Black  
GOVERNMENT moves to boost software development in the regions have been welcomed cautiously by the industry's leading spokesmen - and scorned by the unions.

A White Paper introduced to the Commons by Secretary of State Norman Tebbit shortly before Christmas is aimed at shifting aid from the manufacturing sector to software services. Tebbit specifically invites reform, such as the award of grants for rented hardware to the manufacturer instead of the user.

Doug Eyskens, director general of the Computing Services Association, approving the news, said it made good sense to back the field in which jobs were growing, rather than manufacturing where they were disappearing.

National Computing Centre director David Fairbairn also supported the change, but said it had a note of desperation.

"They feel they've got to try something," he said.

The CBI favours extending aid to services and will respond to the paper in detail in the spring.

But Tim Webb, national officer of the Association of Scientific, Technical and Managerial Staffs, said the policy switch would only accelerate the trend to higher employment in the south-east by building assistance to traditional manufacturing areas.

Although the paper was prepared before Tebbit took office, his imprint is clear on it.

Information Technology Minister Kenneth Baker, noticeably more resilient since the resignation of Cecil Parkinson, told a parliamentary IT committee meeting that his projects had escaped the latest swing of the axe. "This is taken to mean no reduction of its £200-£300 million budget."

## Engineering is set to boom in 1984

by John Riley  
THIS year will be a booming year in demand for computer equipment from the engineering industry, especially from smaller companies in that sector.

That is one finding of a survey published today which highlights the areas in the industry that are ripe for computerisation.

The survey reveals that overall almost three quarters of the estimated 134,000 British engineering establishments have no access to computers at all, and that only 14% have their own computer.

Another finding is that there will be 4,900 new users among companies with up to 50 employees, and 700 among larger companies employing more than 500.

See pages 22-23 for full details

50. Of these, 200 small companies and 450 large ones will acquire multi-user systems.

The survey, which was carried out by International Data Corporation (IDC) for Computer Weekly, comprised a stratified telephone sample of nearly 3,200 engineering establishments. The results were weighted both according to the establishment's size and its sector in the engineering industry.

The total number of engineering establishments with computers could rise from the present 14% to as much as 23% of the 134,000 companies by mid-1984, says the survey. That would mean up to a 60% increase in computer penetration.

When it comes to computer applications, the survey finds that there are several underexploited areas, even in large companies employing more than 500 people. Under-computerised applications include personnel record systems, budgeting and forecasting, and graphics and design applications.

The report suggests that there is considerable scope for engineering companies to computerise graphics and design applications. Of the 17% which actually use graphics or design, only 3% have computerised those applications. The scope is greatest in the mechanical engineering sector, where 35% of



Arrow's Ash hits at government



Engineers are slow to computers



Barber aims for Alvey net

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# Chip firms face bad staff shortage

by Dave Madden

THE European semiconductor industry is suffering a chronic shortage of suitably qualified staff, and the situation will get worse as the demand for its products increases.

That is the dismal message of two reports published by the Institute of Manpower Studies (IMS), a research group based at the University of Sussex and the London School of Economics. The studies, of skilled labour requirements in both the UK and the European semiconductor industry were commissioned by the Manpower Services Commission and Comit, the European Commission's advisory committee on industrial research and development.

According to Richard Pearson, associate director of the IMS, and author of the report: "Chips are the crude oil of the 1980s - they are a vital ingredient of success for the UK and European electronics and other industries."

Pearson warned that shortages of skilled staff will compromise any chance that industry has of competing in world markets with the US and Japan.

Alan Gordon, a research fellow at IMS, explained that the group had visited semiconductor manufacturers and design houses throughout the EEC. These included both indigenous and

multinational companies, to learn their recruitment and training policies, the present state of the labour market, and their immediate plans and requirements.

The survey covered companies in the UK which accounted for around two thirds of the total employment in the UK industry, estimated at 12,000. The size of the UK companies ranged from a multi-national organisation with 1,350 staff, to a UK design house with less than 10.

Gordon reports that the semiconductor industry here, as in the US, is coming out of recession. Lead times for parts are lengthening substantially and he concluded that this will eventually affect manpower requirements.

This improvement in demand will create an already strained situation. According to Gordon: "The number of first degree graduates in electronics and computer science will be decreasing at a time when employers' requirements are rising."

A recent IMS report - *New engineering and technology graduates available for employment 1980-1985* - showed that the supply of electronic and electrical engineers graduating from the universities will stabilise in 1984, and actually fall in 1985. At least 30% of those will not go into the labour market - so less than

1,500 graduates per annum will be available to the whole of the electronics and related industries.

Companies complained that it is almost impossible to recruit people with industry experience in key skills. These skills they defined as integrated circuit design and process and production engineering. The group believes that the pool of experienced VLSI designers in the UK was less than 50 people.

Similarly, the total of process engineers employed in the UK - the people effectively responsible for maximising yields - is estimated to be less than 300.

Shortages of staff in these fields is worsened by the fact that the skills were exclusive to the industry, while other areas, including production methodology, could be staffed by people with electronics backgrounds.

But the companies were not enthusiastic about graduates with highly specialised backgrounds. Some companies were actively hostile to the Masters degree courses in integrated circuit design, initiated by the Science and Engineering Research Council (SERC) at UMIST, Edinburgh, and Southampton, believing that the students' time would have been better spent in industry.

The companies preferred graduates with a sound electronics,



PEARSON... "Chips are crude oil of the '80s."

computer science, or physics background on to which they could graft their own vocational skills in-house.

The IMS reports make a series of recommendations. They call for an increase in the supply of univer-

sity graduates in electronics and related disciplines.

"Key skills and the UK semiconductor industry, NRT Manpower and key skills in the European semiconductor industry, are available from the Institute of Manpower Studies, price £10 each.

## DEC give electronic mail a voice

by Nuala Moran

A SPBEGH synthesiser which users "read" their electronic mail without a terminal was launched by DEC last month. The DECtalk, the synthesiser can message and other information loaded to people dialling a computer by phone.

DECtalk has an RS232C line so it can be linked to any computer. Text is directed to it by the same way as it is sent to a printer. According to DEC, it can produce any text correctly, each word into phonemes.

The company says the mail is sensitive enough to distinguish the different stresses in pronouncing "the orange" and "a banana", for example.

Several different voices available - a middle-aged man, a woman, an old man or woman and a child. By changing the pitch and intonation, DECtalk can make it sound like a man or woman. A DEC spokesman said it can manage a fair range of "I" was born under a wand star".

Apart from electronic mail systems, DECtalk can also be used for information systems. For example talking time tables can be updated without having to record typed information.

Other uses include applications for the handicapped. For example blind people could get DECtalk to read back text and check it is correct; dumb people could get it to speak for them.

DECtalk will be available for sale in the US by March. It costs \$4,000. It will not be available in the UK or the rest of Europe until the end of 1984.

## Alvey aims at comms network

by George Black

A MAJOR aim for the Alvey Programme in 1984 is to establish a communications network, initially linking seven sites and offering connections to many others.

The Alvey Communications Environment (ACE) will be a high performance network using megabit links to join up local area networks at Cambridge and Loughborough Universities, University College London, the Science and Engineering Research Council's Rutherford-Appleton Laboratory, Logica and the research laboratories of British Telecom and Marconi, Chelmsford.

Others are to be invited to take part.

The Alvey Programme director for infrastructure and communications, Derek Barber, intends to prepare a strategy document for publication by mid-February. The responses of participants in the fifth generation project could then be used to draw up a specification. The contract is likely to be put out to tender, with British Telecom and Mercury among the front runners for providing the links.

Barber wants to get the system up and running by the end of the

year, but could not say if the directorate would have to go back to the government for more cash to implement it.

"It's a pioneering venture in one sense and we can't say yet what it could cost," he said. "We will try to provide facilities for interworking between all kinds of equipment."

Others who have been attempting this sort of thing have used a single vendor, whereas we have to provide an open system.

"That in itself could have an important commercial spin-off, which is what the Alvey Programme is all about."

Universities are now starting to take delivery of 10 GEC Series 63 computers, worth over £1 million, for use in the programme.

The exact allocation of the machines has still not been announced, but it is believed they will go to the places most involved in the expert systems element of the scheme.

An electronic mail service for participants over BT's PSS network is due to be finalised by May. A limited mailbox service has been offered in the interim, via the Rutherford-Appleton Laboratory system.



BARBER... "It's a pioneering venture."

## France meets UK trading deal

by Donald Kennett

FRENCH and UK telecommunications officials met in London late last month to discuss opening their markets to each other's manufacturers for provision of up to 20% of their needs.

The initiative came from the French, against a background of repeated public statements, by leading manufacturers - EEC officials and industry observers in the need to create a Europe-wide market in which indigenous companies can get economics of scale to make them competitive with US and Japanese rivals.

The UK is responding coolly. British Telecom has made it clear that its main aim is to get as much UK-made System X into its network as quickly as possible, and this leaves very little spare cash for foreign purchases.

In the longer term it might make a small foreign purchase for comparative purposes, a spokesman said. Its policy remains to evaluate foreign equipment all the time.

The talks involve BT, the French PTT, UK companies GEC and Plessey - which would be keen to sell System X into France

- and the French company, CIT-Alcatel, which wants to enlarge the markets for its E-10 digital switching system.

Despite the UK government's programme for breaking up BT's monopoly of telecommunications operation and turning it into an ordinary Companies Act company, a Department of Trade and Industry spokesman said that such policies would remain in BT's hands for some time to come.

"The talks with France are at a preliminary stage," the spokesman said. "It would be premature to say anything about them. They are a matter for the commercial judgement of the PTTs."

The French are optimistic but similarly reticent. At the inauguration of the electronic directory service in Paris late last month, the French PTT Minister, Louis Moxandean, said there was a good spirit between the UK and France.

The French electronic directory project reached 100,000 minutes of service in the last year - 71,000 in the pilot area in Ile-de-France province, 24,000 in Paris and 5,000 in Picardie.

## Lords tackle the Telecomms Bill

by our Parliamentary Correspondent

THE government has succeeded in pushing the Telecommunications Bill through its report and third reading stages before Christmas, and the Lords will debate it in the new year.

The third reading of the Bill was obtained last week by 313 votes to 187, a government majority of 126. A government gullotine cut short debate at the second reading in November.

The Opposition has fought a strong rear-guard action against the Bill with many heated exchanges. Opposition spokesman Peter Shore said he could recall no single piece of government legislation so clearly against the national interest. It was really a bid to rescue government economic policy, he said.

But Norman Tebbit, secretary of State for Trade and Industry, accused the Opposition of weeping crocodile tears for hours on end, and claimed that the consumer would be protected as never before by the new watchdog body, the Office of the Director General of

Telecommunications. John Butcher, Under Secretary of State for Trade and Industry, promised government incentives to encourage British Telecom employees to buy shares in BT when privatisation takes place in the autumn.

Butcher was also questioned in the Commons last week about fears that IBM is out to strangle ICL. Opposition spokesman Roger Stott said that as the government had rightly sunk much public money into ICL, it was very important that the company retains its capacity to build computers in the UK.

Butcher insisted that ICL's future looked much better than it did two or three years ago when its borrowing was equal to its total share capital. Now borrowing was only 27% of the share capital, and the recovery was still continuing, said Butcher.

Butcher said that in 1981 the government had provided a loan guarantee for ICL, standing at £200 million through 1982. It was now down to £150 million and would taper away completely by



APRIL 1, 1986, Butcher predicted.

The government was anxious, said Butcher, to make sure that its public purchasing initiative gave genuine opportunities to ICL in a free and open market for hardware and software.

In reply to another question, Butcher reported that selective assistance to the information technology industry had risen from £5 million in fiscal 1980 to £26 million in the year ending March 1983.

Harry Greenwood (Conservative, Belling North) took the opportunity to congratulate the government for its success in putting computers into schools. Every government provided by the Department of Trade and Industry led to 20 or 30 additional computers being installed in many primary and secondary schools, he said.

## Report sings mail's praises

SUBSIDISED electronic mail experiments could stimulate significant improvement in the profitability and competitiveness of UK businesses.

So says a report from the National Computing Centre and the Department of Trade and Industry's Electronics and Aeronautics Requirements Board.

The report says that firms which have already experimented with electronic mail have benefited from more effective team work, improved customer service and faster product development. But systems still need to be tailored to their users' requirements and interconnected with other similar systems.

The means now need to be found to fund the development of a communications-oriented high level programming language that will make electronic mail systems written in them easier to modify.



SOZONOFF... "PBX plant will probably be based in Scotland."

## Harris plans plants

by John Riley

US microcomputer manufacturer Harris, currently undergoing a massive organisational shake-up in Europe, plans to open two manufacturing plants in the UK within the next two years.

According to Harris' European head, Alexis Sozonoff, a vice-president and general manager of Harris Information Systems' international division, the company will be made and is likely to build a production plant for interactive terminals in the UK in 1985.

Sozonoff added that it is "probable" that the PBX plant would be based in Scotland. If so, Livingston is the likely location. Harris from Hewlett-Packard, has been the driving force behind Harris' greater concentration on its international commercial market.

He has reorganised his European organisation at the macro level into three business centres, each of which is a separate profit and loss structure which implements product, sales and support strategy.

The three are the information terminals centre, the office systems product centre, and the computer centre. Next year, Sozonoff plans to set up a customer support centre, and by mid-1985, a networking centre.

"Historically, Harris has been because of government activity on secret operations which tied our hands internationally. We are now waking up overseas."

"We've struggled through a tough period," he went on, "and our first goal was to get the finances in order. We have now stopped positioning for survival and are now looking to grow with international marketing strategies."

One of Harris' problems in Europe, according to Sozonoff, has been isolation from US production divisions, and that is why the company is to open plants in Europe.

Sozonoff places great emphasis on the recent acquisition of the word processing and microcomputer company Lanier Business Systems, and although the two companies are being kept separate in the US, they are being integrated in Europe.

"In Europe, both companies are small, with no pre-set organisation. The integration of the two in Europe is an experiment."

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## Information hits dizzy heights

by George Black  
INFORMATION could be recognised as an industry in its own right, if the government gives the positive lead expected in the spring.

The Department of Trade and Industry is weighing up an official report by the Cabinet Office Information Technology Advisory Panel, published in September, which urged the government to treat information as a commodity, taking a much broader approach than in the past.

Colin Southgate, chief executive of Thorn EMI's information technology division and one of the seven-man panel, said the report had met a slower response in official circles than the previous one on cable, but he added that it was "a gathering momentum".

Southgate warned: "Unless they take this on board, it's a market sector in which we will lose out again."

Information was a far wider subject than just information technology, he said. Government should recognise this by creating a single focal point for dealing with the interests of the industry, which, with one million employees, was now as big as construction.

He argued that the government should set an example by making its own data easily accessible in machine-readable form, as the Americans had done. And it should prove it took seriously the value of information by reforming the copyright law.

He said there was a need for more co-operative planning between the government and private sector to ensure that Britain received a fair share of the world market. And he argued that there was a case for having a minister responsible for information, instead of just information technology.

The panel, whose cable report gained an outstandingly quick reaction from the Cabinet, took over six months preparing the second document, entitled Making a Business of Information.

Southgate emphasised that he thought the impetus had to come from the private sector, after the government had responded to the report with a new framework for industry. He agreed with a recent statement by the European Information Providers' Association (Euripa) that government should intervene as little as possible in the market.

He said that publishers, broadcasters and film-makers had been too slow to realise how their interests were converging and to grasp newly-emerging business opportunities.

"It's no good our rushing around producing a lot of high technology equipment unless we used and the value of the information which is being communicated," he said.

"Information firms could start by putting their own houses in order and providing up-to-date statistics on the state of their own industry."

## Arrow boss urges faster cash flow

by John Riley

BUSINESS computers should be sold cash on delivery, and tighter credit controls are needed to speed up the cash flow within small computer companies. That is the view of systems house Arrow Computer Systems' managing director, Brian Ash.

Ash, who has built Arrow from scratch into a £3.5 million company employing 25 people over the past six years, last week hit out at government's ignorance of small businesses' needs and called a halt to the cash blockages suffered by small companies.

"Too many small companies are living from hand to mouth and they can't pay suppliers until they are paid by their customers," explained Ash. "Therefore, by getting customers to pay cash on delivery, as they do in the home computer market, the cash turnover is speeded up."

Another related problem for the small businessman is to check on the creditworthiness of his clients. Ash said that the government was not doing enough to control credit. "On some parts of the Continent it is illegal to write cheques if you haven't got the money in the bank to cover them - but here government controls are lax."

He pointed out that larger companies are affected by the poor financial health of smaller ones, as they are often important customers. "This year a lot of com-

puter companies have been in financial trouble," he said, "and whenever a large company goes down, several new ones are started up by their former employees. These are often totally underfunded and a good proportion of them fail - so there are a lot of bad debts floating around."

Ash said that standard methods of credit control were geared in larger companies. "If you go to a trade reference company, you need to go to a big one. But apart from being expensive, they are slow and not geared up for small business. In our industry we want to make a sale now - not in three weeks' time."

He added that debt insurance schemes, as opposed to factoring schemes to guard against bad debts, were hard to find. He had been required to insure the whole of his customer base. "As 50% of that is government and universities, and they do pay up, it works out to be very expensive."

He added that, although banks could be helpful for references, they did not provide a fully effective safeguard.

Although 1983 was the Year of the Small Business, it had made no impact on Ash. "When the government talks of small businesses, it thinks in terms of companies employing 100 or more people, whereas in our industry potentially fast growing small businesses often have six to 10 people."

## BT tenders high volume optical fibre contracts

by Nuala Moran

UK manufacturers of optical fibres are being offered the chance by British Telecom to get into competitive volume production. BT has invited firms to tender for 14,000 miles of cabling for local junction networks, with the promise that if the price is right it will buy optical fibre in preference to audio cable.

The planned expansion involves eight schemes in five regions. There will be two each in South Wales, Devon and Birmingham, and one in Glasgow and in Manchester.

These schemes do not involve any replacement of existing audio cables. A BT spokesman said they were planned to cope with the increased use of the network, presently running at a rate of 5% per annum, but expected to increase more rapidly with the growth of information technology.

The problem for the manufacturers is that existing audio cables are already very efficient and cost effective to produce.

What BT is effectively saying is that, with its sale to the private sector on the horizon, it is no longer in a position to subsidise manufacturers to get into large volumes, and so enjoy the resulting economies of scale which allow them to break into world markets.

To be competitive in the high volume optical cable business, output from one manufacturer needs to reach 100,000 km/year, according to Sir Kenneth Corfield, chairman of STC, speaking at the World Telecommunications conference in December. He said that this level of production would bring down the cost of optical fibre to the prevailing market cost of 18 pence per metre.

Sir Kenneth said that at the moment none of the three manufacturers in the UK - STC, IICC and GEC - could produce of this volume, with the result that none of them was competitive on the world market.

A further challenge to reduce prices coming from the BT request for tenders will be to the manufacturers of opto-electrical converters, which change signals from light to sound at the end of optical fibre cables.

Another major programme, for

European IT companies.

"The only danger was the rejection of the budget," said a well-placed spokesman, "because then we would have had to have worked on the basis of monthly payments and wouldn't have been able to guarantee anything."

He added that the budget approval left research ministers in the UK and Germany "with no foot to stand on". Both recently refused to sanction funds for the Esprit programme.

Another major programme, for

telecommunications, is still in its formative planning stage, and a high level group has been set up to hammer out priority actions.

The IT task force of the European Community, which will run both programmes from Brussels, is also planning programmes in three other areas: non-Esprit related IT research; communications strategy; and standards.

A policy document on the programmes is expected to be issued on standards by the middle of the year.

There are 20 staff in the R&D centre working on enhancements to HiNet, DMS's local area network. This will include the ability to link HiNet to a range of mainframes and linking HiNet to other different sites, including communications to K25 and beyond. Other work includes development of a

wider range of HiNet terminals and improving disc storage.

The DMS UK subsidiary is wholly owned by electronic news company Bxtel, the major shareholder in DMS in the UK. It was set up in September 1982 with 12 staff. There are now over 100 employees.

A German subsidiary is being set up at the moment. This will initially be a sales and marketing office, but DMS marketing manager Patrick Johnston said it would also be responsible for the UK operation.

HiNet is installed at over 1,000 sites in the UK.

LOCAL network specialist Digital Microsystems (DMS) has set up a research and development centre at its former headquarters in Twyford, Berkshire. Six months ago the rest of the company moved into new headquarters in Wokingham.

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## SALES BRIEF

### BT to supply Blue Circle digital net

BRITISH TELECOM has been chosen as a major supplier by Blue Circle Industries for its new million digital speech and communications network. BT Megastream service, which transmits at two million bits a second between private exchange is the base of the network.

"When our new integrated communications network is complete we shall save at least half a million pounds each year on telecommunications costs," said Blue Circle telecomm manager Roland Le.

### Varsity choice

NORSK DATA, Norway's best indigenous computer maker has been given an £80,000 contract to supply an ND-520 minicomputer to the Department of Physical Chemistry at Oxford University. "The clinching factor was the array processing microcode facility, which increases the processing speed by a factor four to six times," said Eric Coles, senior research officer.

### Scots go online

THE Scottish Office has chosen an online general ledger system from Management Science America as the base of a new management and budgeting system to comply with the government's White Paper urging public sector bodies to become more efficient. MSA's Easy Screen system will be installed in the Scottish Office in Edinburgh at an estimated cost of £100,000.

### Orders for £1m

BURROUGHS Machines has taken orders worth over £1 million in the last year for non-handling document processors, following the establishment of new marketing teams. Recent orders include Thames Water, with a £140,000 order for a S3900 optical character reader system for processing remittances, and an order from the National TV Licence Records Office.

### Ace order

PACKAGE Programs of London has won a US order for its Ace Asset Control and Evaluation System. The order comes from Statistical Tabulation, one of the largest computer bureaux in the mid-West.

### Bank link

SCICON, one of the largest UK computer services groups, has installed a communication link for the Banca d'Italia in Rome in a £30,000 contract. The order involved two of Scicon's Comboard/Hasp 1231 communications links, which connect a DEC Vax 11/750 with the bank's central IBM mainframe computers.

### Powerful system

FERRANTI Computer System is supplying a multiprocessor computer system worth over £800,000 to the Central Electricity Generating Board's North-east Grid Control Centre at Leeds. The system, including 15 Argus 700 computers, will monitor and control the CEB's high voltage transmission network.

### Water network

HARRIS Systems has won a £350,000 order from Wessex Water Authority in Bristol for a PABX digital telephone exchange. Installation begins on the 400-line network this month.

### Baltic contract

THE Baltic Exchange, the international shipping and commodity exchange in the City, has signed a contract with London Specialist Software System (LSS) to supply application software.

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## Candle casts light on IBM units

by George Black

CANDLE, the Los Angeles company that helped to create a market for IBM mainframes, real time, performance-monitoring software, is now diversifying into continuous performance monitoring.

Users have been demanding means of checking not only what their machines are up to at any one moment, but also what they have been doing over a period, says Candle's technical services vice-president, Murty Sprinzen.

The move into continuous monitoring began in October, when Candle introduced its Loglog suite running under the MVS operating system. Next year there will be IMS and CICS versions.

Sprinzen says users have been complaining that existing tools in this field are hard to use, don't collect enough data and don't allow analysis of problems such as delays in response.

IBM has similar products, such as RAFE under MVS, but, according to Candle, it has been far more co-operative towards writers of add-on systems over the past year. "They've told us point blank that they aren't out to hurt us," said Sprinzen.

However, Boole and Babbage, a company which has been working on the European Software Consortium, may be less welcoming towards Candle's intended expansion, both because the two firms are still locked in a patent wrangle

on their home ground of California, and because Boole is selling directly competitive products in this area.

Boole last year strengthened its set of tools with IMF running under IMS.

Candle's Epilog/MVS has had some early success at least in trial sites, gaining some 100 users in Europe and North America since October. Legal and General Assurance has been experimenting with it here.

Candle's ranking in the software hierarchy is hard to define, as it is the bottom edge of the top 20 and turned over about \$25 million in 1982.

## Local network specialist sets up own R&D centre

by Nuala Moran

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HiNet is installed at over 1,000 sites in the UK.

John is 1210











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# Plan IT84

The Information Technology Planning Conference 1984  
Royal Lancaster Hotel, London  
7 and 8 February 1984

## Conference Programme

### 7 February 1984

#### Day 1 Morning

**Chairman's introduction**  
*David Fairbairn, Director, NCC*

**Most significant trends**  
*Mike Reidy, Senior Consultant, IDC Europa*

IDC Europa, the international market research company, and Computer Weekly are combining on regular surveys of the UK data processing industry. Mike Reidy will draw on data from those surveys, as well as IDC's other market research efforts, to map the current and future course of information systems.

**Systems Architecture—the options**  
*Will Zachmann, Vice President, Corporate Research, IDC*

Emerging as a key issue in systems acquisition is the processor or processors. With options available for single, tandem or multiple processors, what are the selection criteria? Allied to this are the capabilities of the operation systems for multiple processors and the separation of data handling procedures (database, dataflow, file servers).

#### Afternoon

**Chairman's introduction**  
*David Craver, Editor, Computer Weekly*

**User software—the options**  
*Reg Book, Group Director, Training and Software, NCC, Fons Kuipers, Consultant, IDC*

While the decision between package or custom software remains, there are new factors which will influence this. There is a choice of software development tools available with

program generators and new design methodologies. What impact if any, will expert systems have in the area?

**Human Interface—the options**  
*David Hebditch, Consultant*

User friendliness can mean many things, from simplicity of system usage to the ergonomic effectiveness of the equipment. What effect will multi-function work stations and graphics capabilities have on human interface? Will voice input begin to replace the keyboard?

### 8 February 1984

#### Day 2 Morning

**Chairman's introduction**  
*Peter Rowell, President, IDC*

**Human resource—the facts**  
*Dr John A. G. Thomas, Publishing Director, Computer Weekly, Deputy Managing Director, Electrical-Electronic Press, John Griffith, Group Director, NCC*

The most important resource. What are the facts about salaries and current trends? What are average staff turnover levels? How do you find, train and then keep your good staff? This session will also cover the role of the IT supremo and the concept of the information centre.

**Communications—the options—1**  
*Martin Healey, Professor of Microprocessor Engineering, University College, Cardiff*

This session will consider the options available for users of local area networks (LAN) giving emphasis to the topologies (Star, Ring, Ethernet) and their application.

#### Afternoon

**Chairman's introduction**  
*David Fairbairn, Director, NCC*

**Communications—the options—2**  
*Professor Martin Healey, Dr. Peter Scott, Manager Communications Division, NCC*

When the network involves remote sites with long distance telephone lines interconnecting them, this is a wide area network (WAN) this session examines the factors influencing WAN systems, the manufactures, the location of people, the modern PABX, teletex and viewdata.

**Communications—the standards issue**  
*Keith Bartlett, DOTI*

International standardisation organisations are making real progress towards supplier-independent standards which are of benefit to users. For IT communications the most important of these standards are for open systems interconnection (OSI) the Dept. of Trade and Industry is supporting the development and introduction of these standards through IT's 'intercept' programme.

#### Panel Discussion

**Application of AI—the options**  
*Brian Oakley, Director, Alvey Programme*

Artificial Intelligence and expert systems are now all the rage. There are, however, very few working systems, and many question whether they have a useful application in the commercial data processing environment. Brian Oakley, who is leading the UK's research and exploitation of the next generation of computer systems, describes what is available and what is promised.

#### Chairman's Summary

# Take two days to determine your IT strategy

Full conference details will be sent to all delegates upon registration, complete with accommodation and travel arrangements. The conference fee of £365 + £54.75 VAT includes morning coffee, full lunch and afternoon tea on both days, as well as documentation.

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PLAN IT84 Conference,  
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To: PLAN IT84, Seminars Administration, National Computing Centre Ltd., Freepost, Manchester M1 8DX

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CW12

CWEE 2

July 1984







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As a result, Intel's 'Open System' approach means that when tomorrow's VLSI technology comes along you'll be in a position to apply it directly. In particular, this can be critical with the

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## Tailor the hardware to the job.

It's practically impossible with a 'Closed System.' The manufacturers discourage it by making everything special, non-standard and proprietary. The 'Open System' on the other hand presents no barriers. Intel publishes its hardware and software interfaces. Increasing your options for using third party hardware and software enormously. And if you need special interfaces designed, you can get them from Intel or third parties. Or you can design your own. If you do, we'll help you.

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For software an equally wide choice exists. The *Intel Yellow Pages* includes over 250 companies and more than 2000

software products and technical services that support Intel architecture.

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You certainly can't with a 'Closed System.' However, Intel understands that companies have different needs and they change during the product's life cycle. For most, it's advantageous to start by buying complete microcomputers and

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Floating point	no	yes	yes
Mass Storage: Floppy Winchester	320 KB -	320 KB 10MB	320 KB 10MB
Multibus Expansion slots	6	5	4
Software Available:	iRMX86, (PL/M, Pascal, Fortran, Basic, C), Xenix (C, other languages available in 1984), system diagnostics and utilities, software support packages also available.		

\*86/310-1 Manufacturer's Suggested List Price.

System 310.

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PROFILE

# A 3,000-mile commuter with the Midas touch

RUNNING two companies, an office in the UK, and especially when it is in the UK, the other 3,000 miles away in Canada.

This is what Brian Warrington does. He set up and runs the communications and business computer company Anderson Jacobson in Slough. He also turned round its Canadian subsidiary, which is now making record profits three years after Warrington went in to try and stop four years of rot.

Warrington actually manages both companies. And in no sense is he a letter-box in the red-inked by Nuala Moran

figurehead in either. Part of his skill is reflected in the fact that he has established sound management teams on both sides of the Atlantic, that can run the companies in his absence.

Warrington set up the wholly-owned subsidiary in the UK in 1975 after persuading one of the company's American founders, Ray Jacobson, that he needed a company here and that Warrington was the man to run it. (The Anderson of Anderson Jacobson doesn't feature in this story. He has already left to set up the magnetic disc company, Verbatim).

Jacobson did not agree to Warrington's proposal until he had been given 12 business references and checked 10 of them, going right back to 1958 and Warrington's first job as a field service engineer with Burroughs Adding Machines.

Then he gave him carte blanche to start AJ Limited.

According to Warrington: "There was little in the way of guidance, and Jacobson doesn't believe in transatlantic telephone calls, so I just got on with it."

The UK company is currently on target for its ninth successive year of growth. Revenue has gone from £185,000 in 1976 to almost £2.6 million in 1982/83. The forecast for this year is over £3 million.

AJ also has a French subsidiary, set up about 18 months before the UK company, and one in Germany, established 2½ years ago. There are distributors in all other Western European countries, which are administered through France.

The only problem was the Canadian subsidiary, set up at

about the same time as that in the UK and which, in 1979, had still had not made any money after four years.

"The Canadian company was losing money, and not growing, and Jacobson didn't know what to do with it," said Warrington. "I remember he asked me what I thought he should do about Canada. I suggested a management audit, or sending in management consultants."

"As far as I was concerned it was just idle chit chat. Then two or three weeks later I got a telex asking me to go over to Canada and find out what was going on," said Warrington.

"I spent a few weeks looking at the company and the environment and sent Jacobson a written report in December 1979 suggesting how to turn the company round."

"Jacobson took the report, considered it for a few days, then contacted me and said: 'Right, now I want you to make it happen.'"

So Warrington was made president of the Canadian company and Jacobson handed all responsibility to him.

Warrington said: "I think the AJ people in the San Jose headquarters thought I was on a hiding to nothing. Although the thought crossed my mind that I was being set up, they should have realised that a Yorkshireman could do it."

Warrington's first act was to move the Canadian office from Ottawa to Toronto.

"Ottawa is a sleepy government town, we needed to be in Toronto which is the commercial centre. We had a branch there but it wasn't doing much for prestige as it was little more than a lock-up garage."

Warrington then turned to the staffing which he deemed was too high for the level of business. "I interviewed every member of staff, which served a dual purpose as it helped me get to know them, and there weren't any personnel files."

"I also looked around at the competition and found out their impression of AJ. Most thought the company was a joke."

"The other thing I changed was the pricing policy. Prices were ridiculously low, but even so we weren't selling because we didn't have enough good sales people," said Warrington.



WARRINGTON... "In Britain the motivation is wrong."

By March 1980 Warrington was ready to get the company on its feet. "It's one thing getting the bottom line the right colour. You've also got to get the growth right."

By the end of the 1979-80 financial year Warrington produced a profit in Canada. To the following year pre-tax profits were up more than 1,000% to nearly \$164,000 on a turnover of \$1.8 million.

Since then Warrington has kept the reins of the Canadian operation.

But it was not all plain sailing. "To start with I made some mistakes over recruiting the wrong people. I had to fire my first general manager after six weeks. And I went backwards and forwards across the Atlantic a lot at the beginning."

PLATFORM

## Will we really be able to pull out the plug

IN all the history of human endeavour there has never been so significant a liaison between theoretical advance and technological innovation as in computing. Its achievements add up to a historical discontinuity in a time-scale that induces intellectual indigestion.

If the recent past is surprising, the future is frightening, and in these circumstances computer people can be excused for taking refuge in the present.

There is a kind of excitement to be found in witnessing the latest flashy bit of technology, and it can be a good earner. But a deeper understanding of both past and present can bring a longer-lasting satisfaction, and perhaps enable a constrained but startling vision about the future.

The true futurist knows a great deal about the past. This helps him to know what can be safely extrapolated and what should be avoided as too speculative. Such caution can still permit quite dramatic predictions.

"There is no security against the ultimate development of mechanical consciousness. Is it not safer to nip the mischief in the bud and to forbid them further progress?"

This was said, not by some present-day Luddite fearing redundancy from the effects of fifth generation computers, but by Samuel Butler in 1872. He was giving a reason for the destruction of Machines in Erewhon.

It was a triumph of pure reason on the basis of untold evidence, the clean vision of man long precised in the art of recognising and rooting out error.

"There is no shortage in history of prophets whose words are sufficiently general to be assured of eventual fulfilment. Sam Butler's futurism was a pretty good prediction of what has since been called machine intelligence, artificial intelligence, expert systems and, in 1982 by John Alvey, intelligent knowledge based systems."

It could be interpreted in other ways. Butler may have known of Charles Babbage's work. In 1864 Babbage wrote: "The whole of arithmetic now appeared within the grasp of the mechanism." That was very specific futurism, though, as it turned out, the time-scale was over-optimistic by nearly a century. The designs were well conceived, but the engineering of the day could not cope with them.

He was, of course, on the track of the stored-program computer, not just a calculator, but a good futurist must be right about technology as well as concepts. There must be realism.

Babbage was talking about the processing of numbers rather than general intelligence. Machines (valve-based) were capable of this by the mid-1950s. Even then, many of those working with these machines did not foresee the development of sophisticated, widely-used general purpose data handling.

What would seem to be the date of the following quotations: "We may some day click off arguments on a machine with the

assurance that we now enter on a cash register."

"Consider a future device, which an individual stores in his books, records and communications, and which is mechanical, that it may be consulted with a ceasing speed and flexibility by an enlarged intimate supply to his memory."

"Wholly new forms of complex patterns will appear."

These accurate predictions of modern information retrieval systems were made by Dr Vannevar Bush in the *Atlantic Monthly* of July 1945. He predicted that systems a decade before the hardware development had begun to make the necessary progress in two or three decades before he became commercially viable.

The limits of machine intelligence by Butler and Bush are like first statements of symphonies to be taken up and developed by Alan Turing in 1950. His brilliant theoretical studies in what may be regarded as the mathematical foundations of computer theory are well known. He showed the class of problems potentially solvable by machines was so vast as to have no theoretical constraints of any severity.

In other words, it all depended on how technology progressed, and he said fairly precisely what he thought about that.

His conjecture, and he was called it anything else, that machines would eventually "think" was supported by a detailed analysis of nine types of objection to such a concept and its retention of such objections.

He predicted that computers would have storage capacity of 1,000 Mbytes by the end of the century and that general education would agree that the could think. By his own exacting criteria his prophecy's not yet fulfilled, though we are fairly close.

It is always difficult for people to believe some new idea that rises in their mind. Galileo's insight that the Earth was not the centre of the universe was (as we read) Darwin's theory linking humans with animals was not well received. Nor were Freud's hypotheses, which seemed to diminish free will and our self-image of ourselves as beings in full control of ourselves. Speculation about machine intelligence might seem to run up to the final destination: the inherent supremacy of biological entities over mechanical ones.

Turing's categories of objection included arguments based on biology, optimism, mathematical consciousness, disabilities (of machines), the nature of software, neurology, human behaviour, even extra-sensory perception.

This varied list has two things in common: ingenuity and inaccuracy. The evidence for the last quality grows year by year. In 1980s, as expert systems increase in number and performance.

Turing suggested a test for a machine for which at least human

included arguments based on biology, optimism, mathematical consciousness, disabilities (of machines), the nature of software, neurology, human behaviour, even extra-sensory perception.

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# ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, January 5, 1984

## Is this alliance good for Europe?

THE alliance between American Telephone and Telegraph and Olivetti could seriously undermine efforts to develop a European approach to information technology. That is unless by some chance the challenge brings home the scale on which European efforts need to be mobilised.

Olivetti chairman Carlo de Benedetti, announcing the tie-up with AT&T, said quite simply that there were no European partners that could strengthen his company the way AT&T could.

Other companies see their challenges as coming from the US as a whole, as well as from Japan. EEC information technology official Michel Carpentier said recently that external alliances were no substitute for an EEC-wide approach.

But a coherent European industry would need a unified European market, and the measures needed appear innumerable — a Europe-wide currency, a Europe-wide harmonised telecommunications network, as well as the overcoming language barriers. The reward for success would be access to a market that is 30% of the world's total — compared with less than 4% in any of the European countries individually.

In concept, a unified European market makes great sense. But it is just not happening. Perhaps the time has come to deal with realities, rather than what we would like to see happen.

## The US exaggerates

HOW far can it go? There is no logical limit to the amount of gadgetry that the US government could seek to have impounded if it felt like it, merely because "we" have got it and "they" have not. But the signs are that the Defence Department, in its protracted wrangle with commerce over technology trade, is getting caught up in its own hyperbole.

Digital Equipment's Vax-11/782 can be fairly accurately described as a leader in its field. But Defence Secretary Weinberger is going too far when he describes it as the "most advanced computer technology in the world". The Vax he was describing was on display at a press conference in Washington, captured in Hamburg "just in time" before it was shipped to the Eastern bloc.

The Vax was designed in 1978. The PDP-11, stopped at Poole the previous week, was designed in 1970. Politicians in every country are bombarded with conflicting advice, but Weinberger should have made more effort to discover how widely distributed DEC hardware is.

Most people with some knowledge of the computer industry would want to qualify his assertion that the shipment would have "enabled the Russians to produce vastly more accurate and destructive weapons".

First, DEC hardware is sold throughout the world, and the Russians would have to be extraordinarily inefficient not to have got what they wanted from non-aligned countries. Secondly, any computer is only as useful as the brains and expertise of its users.

Of course, if the embargo is broadened to include anything that could support a military programme, the possibilities for seizure extend right down to pocket calculators. The Observer recently reported a swoop by Customs at Heathrow airport on Sinclair ZX81s. It is hard to trace the factual element in this story, yet true or not it seems to sum up a general feeling that present policies are hamfisted.

The scope and method of prohibitions of technology trade to the Eastern bloc needs to be drastically revised, as recommended recently by Commerce Secretary Malcolm Baldrige.

This step would contribute more to our real defence than all the McCarthyist scaremongering which the Pentagon is so keen to foster. The result would be the detente in East-West relations which is desperately needed, and a much greater dependence by Communist governments on the superior expertise of the democracies.

Increased trade is the road to mutual trust.

1984 and all that . . .

THIS week's example of the strange things people say about computers was sent in by Peter Williamson of Bristol, who wins £5.

This [why certain drinks require special glasses] is a problem which has baffled the best brains since time immemorial and even now, with the advent of the home computer, we are no nearer to a solution. On The House (Courage pub magazine)

LETTERS

## Electronic brain is way off

IN the report (Computer Weekly, November 24) Is an Electronic Brain Imminent? John Riley refers to a statement by Earl Joseph at a recent annual Pergamon Intotech state-of-the-art review in London. While what Joseph states has some validity it is one thing, and to produce for the marketplace is quite different.

As director of the Cognitive Aspects within the Brain (CAB) project at the Faculty of Computer Sciences, Jerusalem College of Technology, I would like to state that we are still a long way from reality in production of techniques that take place within the cerebral cortex (human brain).

Brain cells on chips that Joseph refers to is a dream we all have, but by "cell" does he refer to a simple neuron, of which there is an estimated 10,000,000,000 to 100,000,000,000 in the brain?

If he does, he is aware that Dr William Shumaker of the Salt Institute in La Jolla, California, a stated authority on the neuron, stated this year that the average neuron "is as complex as an entire minicomputer", that the process within the neuron is as yet still not fully understood, and that we are still a long way off from comprehending its internal function.

While the CAB project agrees that we need a much better and down-to-earth appreciation between biotechnology and computer technology, let us be realistic. Take Joseph's comments on DNA

deoxyribonucleic acid enzymes. I think he is referring to the genetic code, or more precisely to the "double helix" which was discovered by Francis Crick and James Watson. But while we at CAB agree that the DNA can be represented as one bit of memory, it is a very important part of memory, if not the most important, for as we understand DNA it defines the exact chemical composition of the organic species it belongs to, and it is simply a recipe for replicating the structure of that organism. In other words, it is the sequence of nucleotide bases within the double helix, and it is not just the structure of genetic memory, but is the code as well.

The four different bases that constitute the nucleotide chain are letters in the alphabet. Each triplet of three successive bases forms a word that specifies a particular amino acid. There are 20 amino acids, in each gene, to make a polypeptide chain, which folds into a protein molecule, and it is these proteins that define the nature and form of each organism, in particular the enzyme-proteins that determine the metabolic processes that the cell can perform.

Is Joseph aware of something that the leading biophysicists have as yet not fully understood, or is this all just a pipedream? If there is a chance that science can be converted from the brain directly into microelectronics now, then let us hear about it, instead of glib

talk of what is just around the corner. Of course Joseph is right, there are unlimited possibilities, but such unlimited possibilities also exist in many areas of medicine, where there is still no cure. To talk about cutting and splicing a part of the DNA code which deals with image processing and put it in a robot is unique in say the least, and in our opinion very futuristic, but if Joseph can tell us how to do it, CAB will be the first to listen, and suggest that he gets a Nobel Prize for his ingenuity.

We at CAB support the idea of future biochips, but what will they do that could replicate part or parts of the human brain, when in the mid 1980s our leading researchers are still confused about that three pound mass of something like Jell-O consistency, with the colour of day-old slush? It must be fully appreciated before we try to fool others, that what we are trying to achieve in neuroscience is to use the very same structure and cells that we wish to comprehend, in order to comprehend.

It would be useful to try and relate reality to theory and CAB is currently researching two areas: language and cybernetics, and we have a lot of theory, but we are still a long way from reality.

Prof. RAYMOND FELDMAN, Director, CAB Study Project Computer Science Faculty, Jerusalem College of Technology, Israel.

## Run for a good cause

THE next London Marathon will take place on Sunday, May 13, and, once again, I will be captaining the Muscular Dystrophy Group's team of runners.

Last year more than 1,000 people ran for us, and raised vital funds for the group's medical research work to discover the cause of this tragic disease, which affects so many children as well as adults.

May I, through your newspaper, ask any of your readers who are now waiting to hear if they have a place in the marathon, to join our team? They will receive a free t-shirt and running vest, and be invited to join us afterwards at our recovery reception in the Royal Festival Hall.

Once again, the Daily Mirror will be our hosts, and provide a welcome haven, with refreshments, for our runners.

Please join our team, by writing to me: MDG, Freepost, London SW4 0BR.

HARRY CARPENTER, Muscular Dystrophy Group, London.

## Status is versatile

IN the review of Niall Teskey's book *Principle of Text Processing* (Computer Weekly, November 17), Richard Foray implies that the Status storage and retrieval package is only useful for databases of several 100 Mbytes on a large mainframe. In fact, nearly 50% of the 120 Status user organisations are using Status on minicomputers. Database sizes range from a few Mbytes to several hundred Mbytes of text.

We are also implementing Status on a range of micros, including the IBM-PC, which will make Status one of the few free text retrieval packages available on the full range of computers from micros to mainframes.

DEREK MATKIN, Commercial manager, Status AERE Harwell.

## Whole new meaning to mips

SURELY the most pertinent definition of mips comes from Bertram Raphael of Hewlett-Packard.

In the absence of a universally agreed benchmarking program, mips stands for:

Meaningless Indicator of Processor Speed.

ALAN FISH.

## Ansi is discouraging

ANOTHER area the IT Users Standards Association featured in Micro News (Computer Weekly October 13) might look at in the general availability of finalised American standards. I recently sent to Ansi for a copy of a standard. It returned my cheque and referred me to its UK agent — the ISO. I called them and they told me that even requests for general information about Ansi had been referred to them in the past, so

determined is that organisation not to deal with non-Americans. What really got my goat, however, was the fact that my £28 standard would cost £28 plus £25 handling charge or thereabouts. (This was only approximate.) This is a serious discouragement for any non-American company that wants to follow standards.

JUSTIN SMITH, Director, Tailored Solutions, London.

## Bottom marks, Puzzler!

I AM afraid that the Puzzler (Computer Weekly, December 8) was incorrect in assuming that the four squares must all be divisible by zero, but presumably this does not qualify as a positive integer.

In addition there are another five solutions for which X(1) is zero, but presumably this does not qualify as a positive integer.

S. N. HIGGINS, Malvern Worcestershire.

## Too busy to read CW?

WAS Microdata so busy launching its Mica Criminal Index system last month that it did not read Computer Weekly of November 3?

While it claims it is two years ahead of any comparable product (Computer Weekly, December 1), you reported four weeks earlier on their TSIP retrieval system which operates 50 times faster (its ½ Mbyte per sec against 100,000 words per minute) while resolving any number of queries simultaneously.

TSIP was developed by Systems Designers for the government and had undergone nine months' operational use before its public announcement. At its formal launch, its performance was demonstrated on — what else — a criminal incident database.

IAN TRAIL, Senior consultant Systems Designers, Fleet Hampshire.

## Interview

Interview provides the user with terminal compatibility to any CPU with RS232C serial ports, enabling the user to emulate a particular type of terminal on various CPUs.

For further details contact B.S. ELECTRONICS, 1 ORCHARDWAY, HANDSWORTH, SHEFFIELD S13 9LS. Telephone: (0742) 690737/8

DOWNTIME

## Fable of the wombat

NO joke for Apple, of course, but for the rest of us a mild chortle on hearing that the latest, devilish clever Taiwanese Apple-II copy was smuggled into Australia (toldly disguised as a Wombat).

The look-alike was promptly hauled off to court for allegedly infringing the US firm's intellectual rights.

## Have car, must keep driving

THREE are a lot of crocodile and some serious tears being shed by the Data General fans at the field engineering clinics in central London. But it would seem that the company is about to deprive them all of their cars, under the excuse that they don't use their while

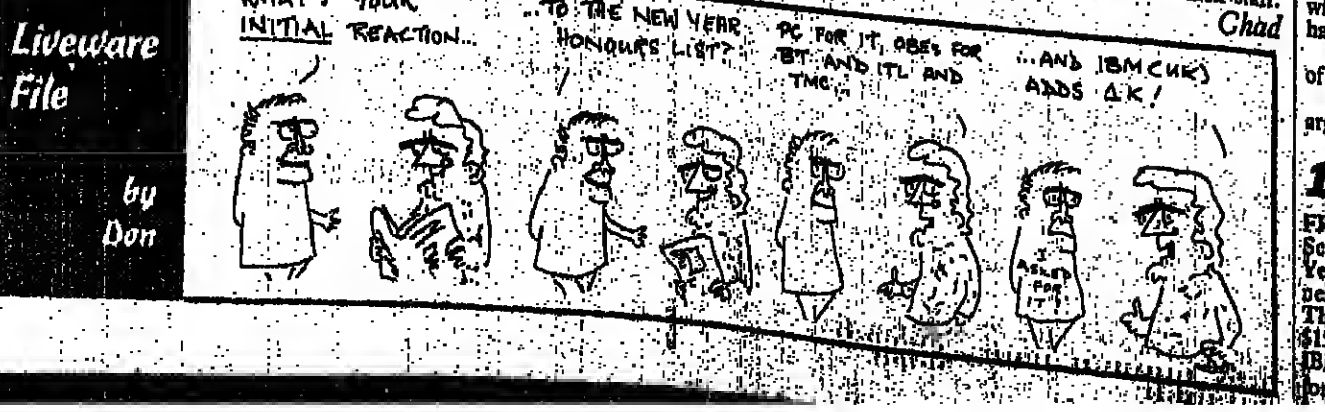


## Suffer from telephone insecurity?

WHILE leafing through the British Telecom booklet on security for staff — a thing that I often do at this time of year — I was amused by an item on page 44 or so. This comes under the general heading of Communications, sub-heading Telephones.

It can be summarised as "staff are advised that telephones are insecure" — translation: don't say anything on a telephone that you wouldn't like to be spread around.

Good of them to tell their staff.



Liveware File by Don

## 10 YEARS AGO

FROM COMPUTER WEEKLY OF JANUARY 3, 1974: Former Polco chairman Maurice Kendall received a knighthood in the New Year honours list. . . . Thorn Electrical Industries formed a partnership with Swedish telephone manufacturer L. M. Ericsson. . . . Thorn taking 51% of Thorn-Ericsson Communications. . . . A fine of £150,000 a day imposed on IBM for civil contempt, levied because IBM refused to hand over 1,200 documents to the Justice Department.



## Ada project was ill-founded

THE project to build the UK's first computer support environment for Ada and C, funded by the MoD and the DfEE, and being run by the Ada Consortium, has been cancelled. The overt reason is contractual and financial, and comment so far has been on the cost of the project and the lack of continued development of Ada and C.

I believe the cancellation to be of enormous benefit to UK industry. I spent some time months on the project and believe the project to have been technically ill-founded.

Why should I think this? It is all a matter of complexity. Much comment has already been made about the complexity of Ada itself, and not without reason, though Ada is comprehensive and has many merits. Any programmer support environment for Ada (and indeed C) should have to control this complexity, so that reliable systems using these languages can be built.

Regrettably the design of the MChape has responded to complexity with complexity, to give a language system which may never have succeeded in implementation, and if it had, may have been unusable.

It could be argued that it requires a complex system to support a complex language, but I submit that that is a non-sequitur. How else could a programmer support environment for Ada have been built? There appear to me to be at least two other very different ways. One way is to integrate tightly the support environment with Ada, so that all for almost all that the programmer must learn is Ada. This means integrating the operating system with Ada and its run time system, modelling peripherals as Ada tasks (like Ocean does with its channels and processes), and providing data management through Ada records following the persistent heap approach of Malcolm Atkinson at Edinburgh University.

It means working very hard at adding nothing extra to Ada, re-interpreting the Ada constructs so that Ada becomes the Ada programmer support environment. The other way is to develop a simple, extendible, general purpose, programmer support environment, to which further language processors and further tools can be added as the need arises. Such an environment could also be appropriate for other computer aided engineering applications.

For this approach, one immediately thinks of Unix, though of course Unix does have several well known defects, and would need a lot of enhancement.

Of course there was much that was good about the MChape project. It was producing language processors for Ada and C, and these are still needed.

Let's not mourn the demise of this project, let's learn from it, and start again. But not another monolith. If the money that would have gone on the MChape is still available, let's redeploy it, perhaps spend less, and certainly achieve more.

In April and in July, the BCS Software Engineering Specialist Group will be having two meetings addressing program development systems - in April on Microprocessor Development Systems, in July on Unix. I hope that these, and other activities like the ACM Software Process Workshop in February organised by Imperial Software Technology, will provide the springboard from which we can in 1984 and following years develop sound programmer support environments.

PATRICK A. V. HALL  
Cirrus Computers  
Fareham  
Hampshire.

IN the last issue a letter from Bill Cadogan, Data General marketing manager, was wrongly attributed to David Neal of MPR.

## Good example of a bad program

I FULLY agree with Paul Higgins' comments (Letters, Computer Weekly, November 24) about the Transbasic language. But I would go further because the sample program used in the competition is a good example of a bad program from the user's point of view.

First, in order to change the data in one field all the other fields have to be re-entered. Secondly, although the "Total" field is supposed to be numeric no validation is done so that any standard characters would be accepted. Thirdly, although records are locked while an enquiry is made they do not appear to be unlocked. Perhaps these simple requirements are too sophisticated for a language designed to keep code to a minimum.

J. A. PILKINGTON  
Senior Programmer  
University of Lancaster.

Wrong attribution

IN the last issue a letter from Bill Cadogan, Data General marketing manager, was wrongly attributed to David Neal of MPR.

## Competition difficulties

I REFER to the competition, Computer Automation and Computer Weekly Programmers' Challenge. Investigation reveals a number of difficulties:

■ Problem specification: Action taken is not reported to user.

■ Will the logic enter an indefinite loop on the first request?

■ Locking of records is not necessarily reported to the program by all systems.

■ "Get new input" is presumably superfluous.

■ "Write new record" and "Insert new key" are presumably part of the same operation.

■ No allowance is made for literals disguised as variables.

■ Program statements are an important measure. No scores taken of this.

■ Comments are either needed and should be reported in the verbatim count.

■ Rule 4.4 appears to be a precedent of programming conventions.

Taken together, these difficulties prompt speculation on the marketing justification for the competition. Is it in fact disguised advertisement, designed to promote Transbasic? There is undoubtedly some enthusiasm, but on the whole, it is not this sort of competition that arouse desire?

Cheltenham  
Gloucestershire.

P. J. SEYMOUR

PLATFORM

Could we ever pull the plug?

Continued from page 16

standards of intelligence were claimed. A human and a computer should be in separate rooms, each communicating through a teleprinter (now it would be a visual display unit) with another human who would transmit questions. The questioner should try to decide which of the two sets of answers came from the machine and which from the human.

It would be possible now to construct a system that would perform in certain restricted areas more like a superhuman. Imagine, for example, a machine that could play chess like a champion and diagnose bacterial infections rather better than the best human doctors. It would not be difficult to add a range of other expertise in special areas like chemical analysis or engine fault diagnosis.

Such a system would not find anyone for two reasons. The style of its replies would not be what one would expect from a human. This would have to be altered. What is more interesting is that the machine would also have to conceal some of its knowledge and reasoning power, or give itself away.

In 1964, Herbert Simon and Allen Newell published an article in the *American Scientist*, in which they proposed that a science of information-processing could be constructed independently of particular mechanisms, which could explain human thinking and be tested by simulation with computers.

They illustrated the theory by analysing some of the thought process involved in chess playing, but they also discussed a broader view of thought processes. Simon and Newell were saying what had been said earlier, but they were specific about theoretical details, and they looked at the problem in a significantly different way. They seemed to be showing how human intelligence can be described by the same theoretical framework as machine capability.

In the same year, Martin Greenberger, with detailed knowledge of the state of research, predicted "a new wave of computer exposition. Computing services and establishments will begin to spread throughout every sector of American life, reaching into homes, offices, classrooms, laboratories, factories and businesses of all kinds."

That was just a year before John Kennedy and Thomas Kurtz published a new computer language which they called Basic. It spread like an epidemic caused by some new bacterium.

The Alvey Report, *A Proposal for Advanced Information Technology* (HMSO 1982), is now government policy and a £350 million project. It doesn't predict the future so much as create it.

A major thrust will be in the technologies that support intelligent knowledge based systems. They exist now, but in rather cumbersome, expensive forms. The fifth generation systems are likely to be cheap, powerful, portable and plentiful.

With the benefit of the great writings of the past and a knowledge of modern technology, it is not difficult to conclude that the writers of the past were too conservative. They said that machines would think as well as humans, and in doing so they set an arbitrary and limited goal. The question is not will machines think, but will people?

Biological evolution is very slow and it is unlikely that people will reason much more effectively in the next 100 years than they have in the past 100. Problems like nuclear disarmament, population growth, world, or even national, economics all seem beyond our ken.

If a few members of the human race become very wise compared with others of their generation there may be no certain consequences. They may be celebrated, but more likely they will be ignored by the vast majority.

On the other hand, if a greatly superior machine appears, its attributes will spread swiftly, and within a few years its inferior progenitors will no longer be reproduced.

There is no reason to assume that machines will not advance in the next few decades as quickly as they have in the last few.

Machines may be able to solve about a range of problems that humans find intractable. And we cannot assume that we are clever enough to take the advice and remain in control. In reality, it is rarely possible to pull out the plug.

We can no more guarantee that we will continue to dominate the world than could the Neanderthals, who were displaced by Cro-Magnons about 40,000 years ago.

Suppose we tried. Suppose that in some schools there were radical reforms aimed at better understanding of machines. Suppose that children studied sociology and cybernetics; that history became recent history; and that computer studies became a serious attempt to understand the context and the modern reality of information technology.

How could we get such reforms? The only hope would seem to be from machine-aided learning. It seems that if we want to understand machines we must deal

with them.

Workplace

Stanford professor gets \$21m grant

PROFESSOR Jon Barwise of Stanford University, California has been given a research grant of \$21 million for fundamental work on artificial intelligence.

The money comes from the System Development Foundation, a non-profit making research group set up to invest in long term research in artificial intelligence.

The grant, awarded for a four-year period, is one of the biggest yet for this type of research - and Barwise says it is just the beginning.

"It is to get the centre up and running," he says, "then we hope there will be more money."

Barwise is setting up at Stanford what he calls a centre for the study of language and information, with a team of 17 senior scientists, 16 junior scientists and five graduate research students.

But the centre will also call on the expertise of academics all over the world and will act as a US forum for theoretical work on language and computer science. This was the prospectus that won the grant.

Among well-known consultants linked to the group are Joan Brehm from the Massachusetts Institute of Technology, and Stanley Peters from the University of Texas. Professor Rod Burstall of Edinburgh University is on the advisory panel.

Barwise says the first project - which is starting immediately - will be to develop a theory underpinning natural and computer language, and to determine the common ground between them.

The centre will break down traditional barriers between academic backgrounds, insists Barwise. Logicians, linguists, philosophers, mathematicians and computer scientists will empathise, he says.

It will also break down barriers between institutions, Barwise adds. Universities will be co-operating with companies such as the Xerox research laboratories, which lie close to Stanford University in Palo Alto.

Barwise has for several years been trying to develop a logical system for the description of natural languages alongside John Perry at Stanford. He has already staked up the fires of debate between proponents of different computer languages by criticising the mathematical basis of Prolog, the language described by the Japanese as crucial to their fifth generation computer project.

Listed with the quote is the Bible Concord runs under the CP/M operating system on the Research Machine 3802, and is available to many schools as an alternative means of Bible study. Included in the £40 price is software for online enquiry that enables quotations to be listed according to subject, such as "truth".

Work began in 1975. Frequency analysis was the first technique for compression, using short symbols

## Happy New Year for contractors

CONTRACTORS were able to enjoy a longer Christmas holiday than most people - whether they liked it or not. But they can compensate for that with the knowledge that there is plenty of work not far round the corner in the New Year.

Many contracts finished at Christmas. New ones to replace them do not begin until once in the New Year - it takes six weeks to reach the pre-Christmas level.

"There is a higher incidence of contractors out of work in January than in any other month," said Vic Groves, founder of VNG Professional Services. "It's a good month for them to take a skiing holiday."

Christmas is always a busy time for the agencies, with the danger of a drastic fall in business if new contracts are not fixed up before

clients shut down for the ever-longer winter break.

KING Computer Support of London has about one-third of its contracts ending in December, according to the agency's systems programming manager, Keith Roland.

"We expected a dip around this time," he said. "We pick up an extra 30% in January from the number out of work the week before Christmas."

Knight Computer Services also reports a surge of contracts starting in the New Year, but claims that it has managed to avoid the traditional Christmas dip in the number of contractors at work.

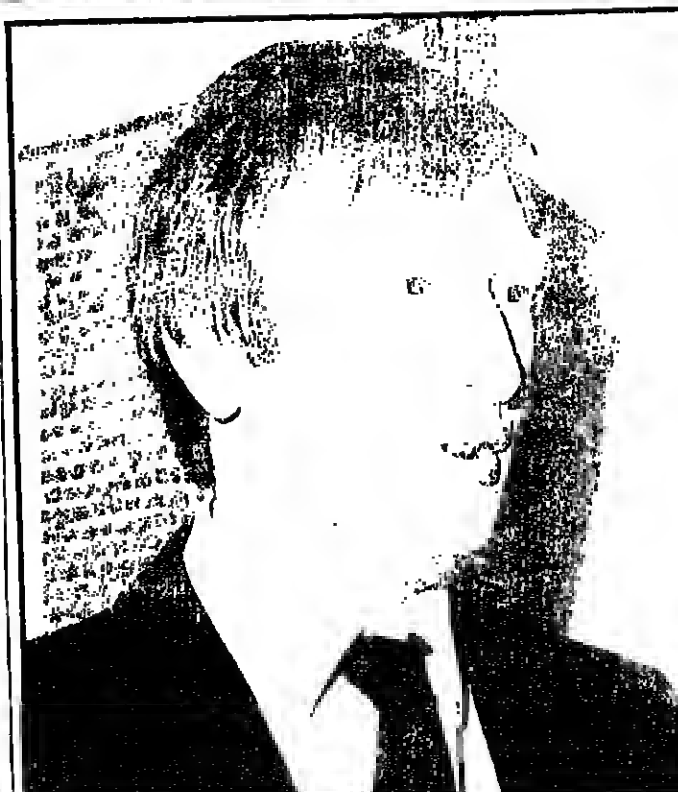
"We are extending most of the contracts into the New Year," said contract manager Richard Kaluzinski. "Not many finished at

Christmas."

The type of skills in demand for the New Year is not unusual. "IBM skills are the most important things at the moment," said Kaluzinski. Contractors with experience of CICS, DB2 and IMS should have little trouble finding work, while ICL programmers and analysts are increasingly in demand.

According to VNG's Groves, there was a big increase in demand for people with Cobol experience on the Digital Equipment Vax last year. Like others, VNG has come under increased pressure to supply contractors with ICL IDMS and TMS experience.

Groves' New Year message is: "Permanent employees with these skills considering going freelance will never regret it."



GROVES... "Contractors should go skiing in January."

## Programmer with a palate for the good things in life

COMPUTER programmers are notorious gourmets, and many of them, I suspect, nurture a wish to set up their own restaurants.

Nicholas Blacklock realised this dream two years ago when he became a partner in the new haute cuisine restaurant, D'Artagnan in Blandford Street, just off London's Baker Street.

After over 20 years in the computer business, Blacklock joined the restaurant and is now head chef, responsible for serving up one of the most exquisite, if expensive, French menus in London.

For £7.10, for example, you can tickle the taste buds with Ballotine de Pintade aux Champignons Sauvage - in translation, a poached breast of guinea fowl filled with seasonal wild mushrooms.

As well as doing much of the cooking, Blacklock is responsible for buying all the wines listed on the restaurant's extensive list.

He graduated in psychology at Oxford University, then trained as a programmer. Later he moved into computer services and became

chief executive of Computer Services Centre, which grew into a firm with a £3 million turnover.

But meantime, Blacklock was developing his culinary skills, and often catered single-handed for parties of up to 70 people at his family home in Suffolk.

But why give up computing altogether? "At least in catering I shall not be always looking over my shoulder in case somebody has invented the mega-bean," says Blacklock.

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## Bible on disc is the most accurate yet

IT took De Samuel Johnson nine years to compile the first proper dictionary of the English language. Now it has taken just eight to compile a development some would regard as just as momentous - putting the Bible on disc.

Bible Concord runs under the CP/M operating system on the Research Machine 3802, and is available to many schools as an alternative means of Bible study. Included in the £40 price is software for online enquiry that enables quotations to be listed according to subject, such as "truth".

Work began in 1975. Frequency analysis was the first technique for compression, using short symbols

to represent commonly occurring words such as "the" which appears 60,000 times in the Bible.

This enabled the Bible to be sorted in four discs, but was not enough to produce a single disc version for the emerging microcomputer.

Then in 1980 the research team found a clue in the original Hebrew text of the Bible. The Hebrew alphabet consists of 22 consonants, but no vowels, and the reader had to use his knowledge of the language to determine what the vowels were.

Bible Concord used this as a second compression technique, representing the word "drawing" as

"drwg," for example.

The Reverend Derek Tinsley, who was called in to evaluate the project, said that the potential value for religious and educational purposes was enormous.

Tinsley also points out that the development work on the program has helped to correct many errors in the standard version.

"All the different versions of the Bible were examined, even the Hebrew Bible and material from the Dead Sea Scrolls."

So not only is Bible Concord the first on a single disc for a small microcomputer, but it is also one of the most accurate versions yet produced.

## Getting the micro dealers into training

RECENTLY there has been increasing emphasis on customer support from microcomputer dealers. So why not set up a company to train dealers to do it better?

Nitin Amin is forming a company called Hi Tech Training for this purpose, and the first course starts on February 13.

In a week, he aims to teach dealers how to plan a training programme for customers who know little or nothing about microcomputers.

Those on the course will have to present their own mock training programme, then watch their performance on video, followed by an open discussion of their failings.

"This is to get a yardstick of how they are behaving before the course," says Amin.

He was a manager at Rank Xerox stores before leaving to set up Hi Tech.

"There is an enormous gap between selling a micro and teaching people to use one," Amin says.

The week's course will cost £695, but participants will be able to claim back £100 from the Manpower Services Commission, which has approved the course for its grant support.

There are two courses in February and one in March. Amin plans to run one a month, each limited to eight people, at the Institute of Marketing in London.

## Prestel helps to ease needy children's plight

IT is always time to ease the plight of those in need - and Nula Conwell has been doing her bit.

She works in the public relations office of Prestel, and recently helped the BBC's Children in Need Appeal to raise over £500 by creating special pages for Prestel users to pledge donations.

It was the second year Prestel had been used in this way. "We decided to set up a database and let people pledge money," says

Conwell.

Prestel users were invited to make their gift by using a special response frame during the BBC's appeal programme on November 25 last year, composed by Terry Wogan. They simply pressed a number on the keyboard, then the amount they were prepared to pledge.

The appeal people at the office end just had to wait and hope that people had not pledged in vain.

### PUZZLER

I HAVE just been shown a numbers game in which two people each write down a scrambled sequence of the figures 1 to 6, keeping the details hidden from their opponent. They then take turns at trying to be the first to guess the opponent's sequence. For example, at his first turn X will call out a random sequence, and Y must reply truthfully "... eight", depending on how many figures have been correctly placed - but not saying which ones specifically are right.

Here are my opponent's first five replies from a recent game. I tried 162435 and received the reply "one right"; then 162453 "none right"; 426153 "one right"; 246531 "three right"; and 425136 "none right". From this data I was able to deduce (using pencil and paper) my opponent's hidden sequence. Can you work it out before turning to page 63 for the solution?

Workplace is compiled by Philip Hunter

Earl's Court, London.  
June 5-7, 1984

software '84  
EXHIBITION AND CONFERENCE

Certainly the major software event of 1984 will be Software '84, to be held for the first time in Central London. Software '84 will be totally dedicated to professional software sales and will be held from 5-7 June 1984 at Earl's Court in the centre of London, the Nation's biggest commercial market place.

Such a show could only come from a company that understands the computer market. Reed Exhibitions, the country's largest exhibition organisers, will be staging Software '84 with all the skill the company has already brought to the highly successful Compex shows.

Inevitably, top quality business visitors will be drawn to the exhibition and the various business and professional end-users will be visiting the exhibition with nothing but software purchases at the forefront of their minds.

With that kind of captive audience you can't afford not to be a part of this important event. So turn the key to the software '84 exhibition below.

Association with Systems International, Practical Computing, Micro Business & Computer Talk

I am interested in exhibiting at Software '84

Please send further information on Software '84 Conference

The Exhibition Manager, Software '84, Reed Exhibitions, Surrey House, Throley Way, Sutton, Surrey SM1 4QQ.

or phone 01-643 8040 NOW!

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Tel. No. \_\_\_\_\_

software '84  
EXHIBITION AND CONFERENCE



## NatWest squashes opponents

NATWEST has won through in the final of the Press Wright Line Squash Tournament. NatWest's Ray King took his second victory against Neil Wainwright of Barclays Bank, who won the fifth round of the final. The Wright Line 1983 Squash Trophy was the reward plus individual trophies for each member of the team. King, captain of the team, also won a Press Wright Line voucher for NatWest to spend on future products.

NatWest had earlier beaten British Aerospace in the semi-final, and Barclays had defeated the FVTI team from Swansea. All teams were drawn from companies' computing departments. About 400 tennis took part.

**John Hezins**, managing director of Computer Computer Systems, Milton Keynes, has been winning himself on a private boat in Barbados, as a result of being winning a prize in a sales competition of microcomputers for manufacturers LSI Computers.

Hezins says it took him less than two months to reach the winning post, without ordering a single machine over. The prize was a week in Barbados for Hezins and his wife. Computer has been a dealer with LSI Computers for two years and is now looking forward to being a leader in the field on the Octopus range.

**Diane Noy and Sherry Challinor**, ex-employees of software publishing house Dataview, have branched out on their own to form Datastream, to provide a range of services for both the user and dealer, including training on major software packages such as Wordstar, Wordstar, DMS and Tegast.

**Future Technology Systems**, British manufacturer of professional computers, has appointed **Joe Lee** as international sales manager. Lee will be responsible for sales of the Series 86 throughout North America, Central America, the West Indies, Germany, East Europe, Finland and South Africa. He was previously marketing manager with Bric Computing, a division of ICL, for two years.

**Package Programs** has appointed **Drew Rogers** as director of marketing. Before joining PPL he was business planning manager of the TSB Trust Company for six years. His career includes a number of years with Rank Xerox and Kalamazoo in sales and marketing, both in the UK and overseas.

**Michael Redshaw** has joined Lincas as a UK product manager. Previously he worked for the VNU Publishing Group as advertising features manager in Computing.

**Chunari**, the Cambridge-based microcomputer manufacturer, has appointed **Peter Robertson** (above) to the position of sales executive, responsible for major government accounts. He has had over 19 years' experience in the computer industry, having previously worked with the Uniflex Group and DPE.



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**QRII Computer Group** has announced the opening of a new office in Worthing, to be headed by **Barrie Compton**. He has 15 years' experience in the industry.

**Anup Patel** (above) has been made general manager of the West End division of Patrick & Leach Microcomputers. Prior to a short spell as a senior consultant to the financial controller and commercial manager over a period of two years with the Dixons Photographic subsidiary, Barclay & Sons.

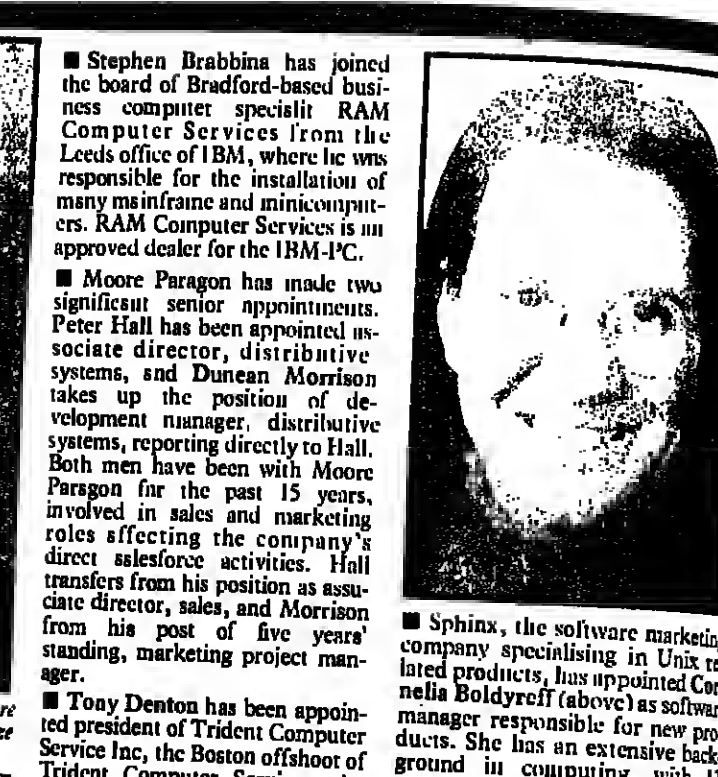
**Richard Hease**, founder of *Which Computer?* magazine, and head of Micronet 800 and Prim Microproducts, has joined the board of investment trust United Computer and Technology Holdings. The existing board already comprises experts in business management, venture capital and high technology.

**Peripheral distributor Rapid Terminals** has appointed **Adam Mack**, formerly sales manager of Dico, as sales manager. In addition, two new sales engineers, **Chris Barnes** and **Shirley White**, join Rapid Terminals' expanding field sales force. On the engineering support side, **Rapid Terminals** has appointed **Bill King** as technical manager.

**Roger Camrass** has rejoined information technology consultant Butler Cox & Partners as director of telecommunications studies after 2½ years at Arthur D. Little as leader of its UK telecommunications practice. He is author of *How to Buy a PABX*, a book published by Oyez Science and Technical Services.

**Nihal Sinadural**, a head of section at British Telecom Research Laboratories, has received an award for outstanding technical achievement from the International Society for Hybrid Microelectronics at a ceremony in Philadelphia. Dr Sinadural was the first non-US recipient of the award.

**Dick Lane** is to be director responsible for finance and administration at Rascal-Milgo. He joined the group in 1976 at Rascal Technical and held a number of financial posts before moving in 1979 to Rascal Records at Hyde, Cheshire, as financial director and company secretary.



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**Stuart McRae**, has been appointed sales executive for the newly-formed Business Systems Division of Chubb Cash Registers. He is based at the company's Southern region offices in Mitham, Surrey. McRae joined Chubb Cash Registers in 1971 and has been with Chubb since it took over the Gross business in the early seventies.

**Analyst/programmer Alanair Green** of Birmingham has won the first prize of a winter holiday for two in a special Christmas draw organised by Computer Search and Selection of Hemel Hempstead, held to celebrate its new Croydon office, which opened recently. The draw was open to anyone who registered and took a contract with the company between April and October 1983. Green may take his two-week break skiing in Italy or sunbathing in Morocco.

**Geac Computers Europe** has appointed **David Thomas** as commercial director of Geac's group of companies in Europe. He was previously financial controller of Geac Computers Ltd, the UK sales and service subsidiary of Geac International.

**Kennedy & Donkin Systems Control**, the independent systems engineer in computing and control, has recruited two new engineers. **John Borer** has joined the firm as a systems engineer, and **David Sawyer** as a control and automation design engineer. Borer has 23 years' experience in design, construction and commissioning of industrial control schemes in the chemical, fibre, oil, gas and metallurgical industries, with companies like Esso, Evershed & Vignoles, Monsanto and Calci. Sawyer has 14 years' experience in planning, estimating, designing and commissioning of advanced industrial control schemes, particularly in the metals and glass manufacturing industries.

**Alex Evans** (above) has joined Maindec as a director to promote the new computer sales division. His experience includes nine years in field engineering, R&D and international sales. Maindec started operation in 1979 as a third party maintenance company specialising in DEC equipment. The company now offers mixed hardware PDP11/Vax configurations with total system maintenance cover.

**Computer Technology Ltd** managers for its public sector sales division, **Ian Morrison** will work closely both with public sector end users and with the software house to individual customer requirements. Before joining CTL he worked for Leasco Software as a senior consultant. **David Lawrence**, also appointed project manager in the public sector sales division, joined CTL in 1979 as a sales executive.

**Paddy Roche** has been appointed general manager for Phillips Business Systems Viewdata. Formerly national sales manager for the Phillips team, Roche previously worked in video and television.



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**Sphinx**, the software marketing company specialising in Unix-related products, has appointed **Carole Boldyreff** (above) as software manager responsible for new products. She has an extensive background in computing, with 12 years' experience in computer centres at UK universities and, more recently, four years' heading the microsystems software unit in the South West Universities Regional Computer Centre.

**Stephen Hurcombe** (above), 17, has won £1,000 in the first national Microquest competition sponsored by Williams and Glyn Bank and run in association with MAP, the Department of Trade and Industry's Microelectronics Applications Project. Hurcombe also takes home £250 as the Midlands regional winner of the competition, which asks young people to produce ideas for innovative uses of microelectronics in industry.

**Herbert Shanzer** has been appointed vice-president and general manager of the new Desktop Division of Data General Corporation. He joins Data General from Texas Instruments, where he was division manager responsible for home computer products. Previously he spent eight years with Digital Equipment Corp.

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**Rhys Williams**, managing director of Gecom, has succeeded **Dea Pitches**, former managing director of Plessey Telecommunications and Office Systems, as president of the Telecommunications Engineering and Manufacturing Association.

**Alpha Microsystems** has appointed **Christian Denis** as sales manager for the company's newly-opened Benelux office. He was previously sales manager with Computer Resources, Brussels.

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## PEOPLE



## Boy's idea is a winner

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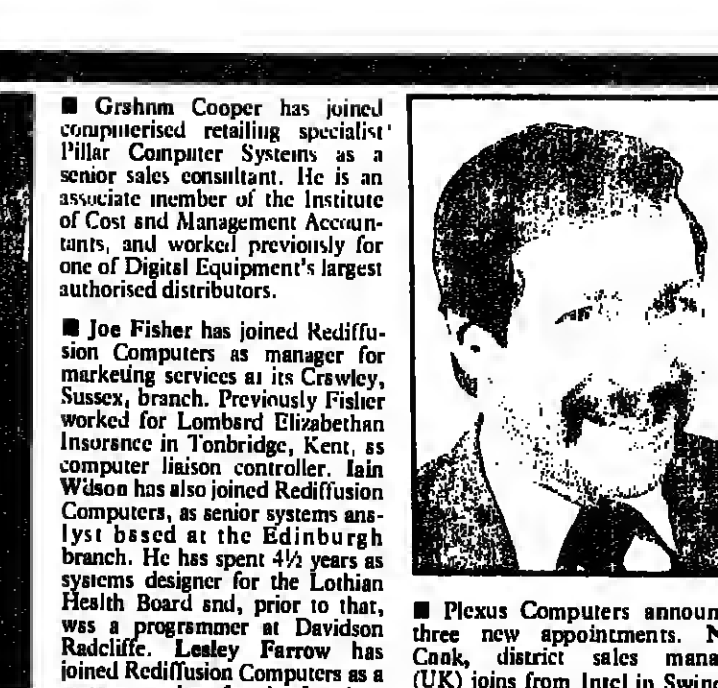
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## Two join Xtec board

**Joe Fisher** has joined Rediffusion Computers as manager for marketing services at its Crawley, Sussex, branch. Previously Fisher worked for Lombard Elizabethan Insurance in Tonbridge, Kent, as computer liaison controller. **Iain Wilson** has also joined Rediffusion Computers, as senior systems analyst based at the Edinburgh branch. He has spent 4½ years as systems designer for the Lothian Health Board and, prior to that, was a programmer at Davidson Radcliffe. **Lesley Farrow** has joined Rediffusion Computers as a systems analyst for the London, North, branch. Previously Farrow was with the Dutch Civil Service as a programmer.

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## CONFERENCES

**UNILEX** Conferences is running several exhibitions/conferences at the Barbican, London, from March 13-15 1984. These are a Business Telecom exhibition, and conferences entitled: Telecommunications for Today, Satellite Communications and Mobile Communications. Details from: Online Conferences, Pinner Green House, Ash Hill Drive, Pinner, HA5 2AB. Tel: 01-868 9933.

**SCOTTELEX '84** is the 15th annual Scottish electronics exhibition and convention, run by the Institution of Electronics, from June 5-7. The venue is the Royal Highland Exhibition Centre, Inverness. Admission is free, via the exhibitors and sponsors. Further details from: Institution of Electronics, 659 Oldham Road, Rochdale, Lancs OL16 4BE. Tel: (0706) 43661.

**THE** sixth European Conference on Artificial Intelligence takes place in Pisa from September 5-7, 1984. It is organised under the auspices of the European Co-ordinating Committee for Artificial Intelligence. Call typed copies indicating length, word abstracts are required before March 1. A two-day tutorial programme will precede the conference and an industrial exhibition will take place during it. Details from: O'Shea, Programme Chairman, Institute of Educational Technology, Hull, Milton Keynes MK7 6AA. Tel: (0908) 632088.

**Prost & Sullivan's** three-day seminar on structured testing will be held on March 5, 6 and 7 at the Cumberland Hotel, London. Admission is £425 plus VAT. The seminar aims to provide a comprehensive guide for designing, testing and debugging software, with particular emphasis on preventing errors. Another Prost & Sullivan seminar, Database Concepts, at the Cumberland Hotel, on March 12, 13 and 14, Urbach, will examine the planning activities which must be performed in the early stages of database development to ensure orderly, effective implementation. Further details can be obtained from: Carolyn Budd on 01-489 93449.

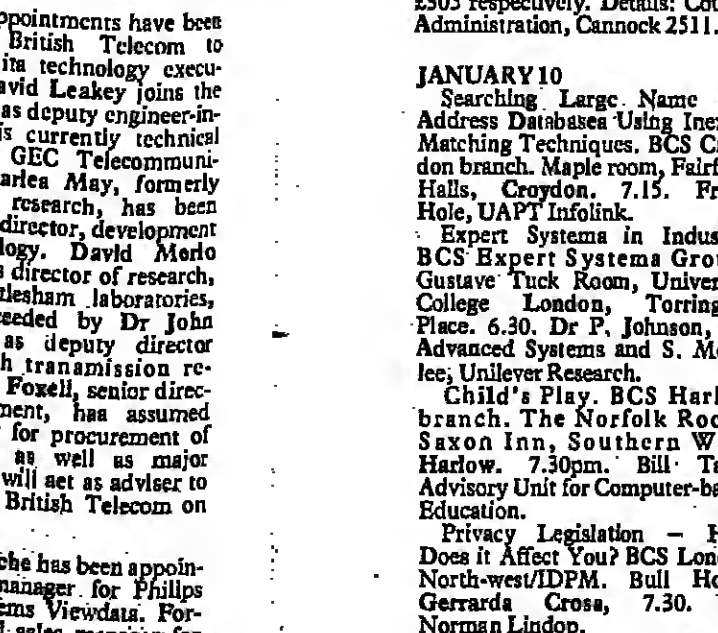
## SEEING IS BELIEVING

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Shortlands, London W6 8BT. Tel: 01-741 0301. Telex: 916148.

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National Exhibition Centre, Birmingham. January 17th-20th 1984



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# Cautious engineers still wait for their turn with computers

Computer Weekly and the International Data Corporation (IDC) presented their first survey on trends in the UK data processing industry in the September 22 issue. The second in the series focusses on the engineering manufacturing industry.

Mike Reidy, senior consultant at IDC, presents the findings of a

survey based on 3,190 establishments in the UK (excluding Northern Ireland) which were interviewed by telephone between May and July 1983.

Future surveys will include other manufacturing, finance, insurance and banking, retail and wholesale distribution services, and government.

THERE are 134,000 establishments in the UK in the engineering sector (including the construction industry), but only about 18,200 or 14% have their own in-house computer. Another 6% have an accounting machine or some other specialised system.

Another 7% or so have access to a group computer or DP bureau. This leaves almost three quarters of establishments in the engineering industry without access to any computing facility whatsoever (see Table 1). This is but one of the many significant results emerging from a recent in-depth survey for Computer Weekly carried out by the International Data Corporation (IDC) on computer use in the engineering sector in the UK.

The figure of 14% of course is an industry average and conceals substantially different computerisation (or penetration) rates in different sizes of establishments. The figure in fact ranges from 6% in establishments with 10 employees or less to 98% in establishments with over 1,000 employees (see Table 2).

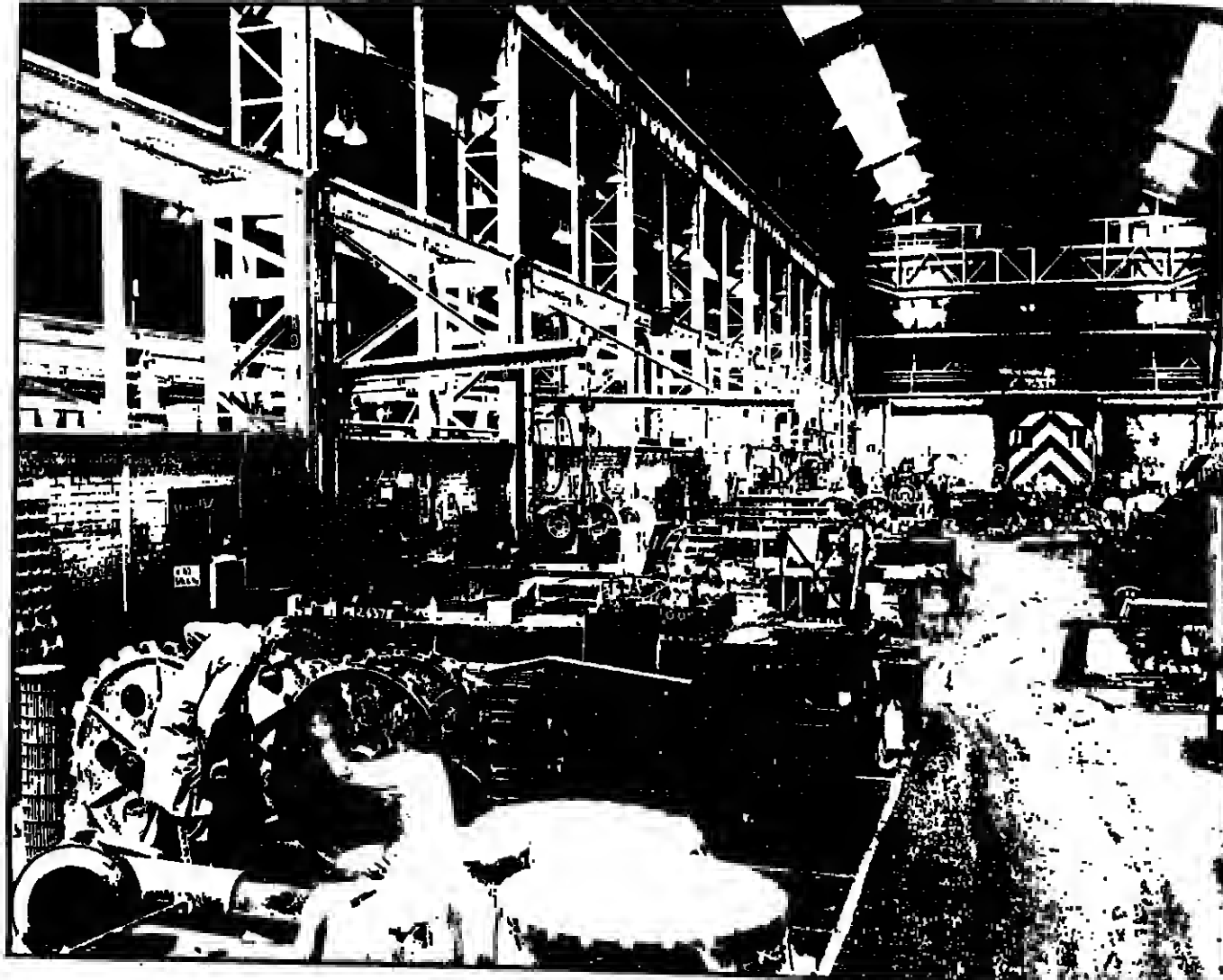
The survey indicates that this computerisation or penetration rate is very likely to increase quite sharply - from 14% to 18% in the

next 12 months - with a possibility it will be as high as 23% by mid-1984.

Significantly, the greatest proportionate increase in the penetration rate will be in establishments with 10 employees or less, where the penetration rate will increase by 50% from 6% to 9% in the next 12 months. Furthermore, in absolute terms, the greatest increase in the number of new computer users will be in establishments with less than 50 employees where there will be about 4,900 new computer users in the next 12 months as against only 700 new computer users in larger establishments. Table 3 summarises the position. It is very significant that the vast majority (about 87%) of new users will install only microcomputers. About 13% will acquire larger systems.

The survey casts very interesting light on the degree to which various applications are computerised in various sizes of establishments. The most striking feature which the survey highlights is the high degree to which many relatively standard applications are not computerised, even in larger establishments.

For instance, in 45% of establishments with more than 200 employees, where a personnel function is performed, there is no computerised personnel record system (see Table 4). The corresponding figures for smaller establishments is 67% for establishments with 25-99 employees.



Larger machines tend to be used more for payroll, accounting and sales/marketing. Interestingly, graphics and design applications are disproportionately performed on both very large computers and microcomputers. Personnel record applications, on the other hand, are disproportionately performed on small multi-user systems (see Table 5).

On reflection, this application split between different sizes of computer is quite understandable. Budgeting/forecasting, technical/scientific applications and word processing are mainly departmental functions and are thus more likely to be performed on smaller departmental computers such as a microcomputer.

Payroll, accounting and sales/marketing tend to be corporate functions and thus tend to be performed on larger computers. Personnel record applications are somewhat of an exception. While on average they tend, as mentioned above, to be performed on small multi-user computers this does not apply to all sizes of establishments.

In fact, as Table 4 illustrates, computerisation of many applications only takes off to any significant extent in establishments with more than 200 employees. In smaller establishments the degree of computerisation, even of standard applications such as payroll and accounting, is remarkably low, even when one only considers establishments in which these applications are actually performed.

Another interesting feature which the survey highlights is the tendency amongst the user base to perform certain applications disproportionately on certain sizes of computer. Microcomputers are disproportionately used for budgeting/forecasting, technical/scientific, graphics/design applications and word processing.

Table 1: Different degrees of computerisation within engineering establishments.

Very interestingly, on larger sites with more than 200 employees, personnel records applications are disproportionately performed on microcomputers. This may suggest that on certain larger sites the computerisation of personnel records, as far as the central data processing department is concerned, is a low priority, thus obliging the personnel department to seek their own solution through the acquisition of a departmental microcomputer.

The IDC survey also highlights graphics and design as an application area with interesting characteristics. The survey shows that of the 134,000 establishments in the engineering industry only 17% actually perform any kind of graphics or design. Furthermore, only 3% of all establishments have actually computerised these applications to any degree.

Even if one excluded establishments in the construction industry where there is an

abnormally low computerisation of graphics/design that percentage only increases to an average of 7% (see Table 6).

In terms of the types of computers used for graphics and design applications the survey indicates that a microcomputer is used in 70% of cases. In another 7% of cases they are performed on specialised CAD/CAM systems. Only in the remaining 23% of cases are they performed on larger systems (see Table 7).

The survey casts very interesting light on the current relative market share of various computer vendors in the engineering sector of the market. The survey also indicates that there will be substantial shifts in market shares in the next 12 months in the microcomputer area where more and more vendors, including mainframe vendors, are entering the fray.

At the top end of the market in large multi-user systems IBM is

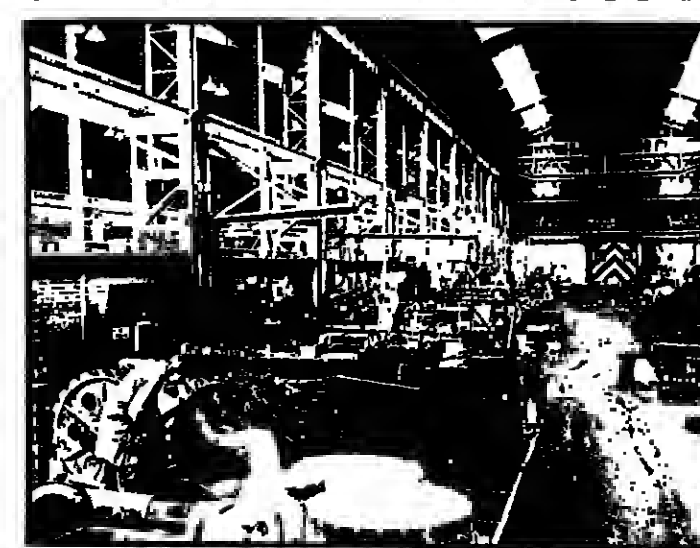
Continued on page 23

Size of establishments	No. of employees	Mid-1983	Mid-1984	very likely	possible
1-10	11-24	6%	9%	15%	15%
25-49	50-99	25%	35%	40%	27%
100-199	200-499	46%	52%	58%	40%
500-999	1,000+	70%	76%	77%	77%
TOTAL		84%	88%	88%	88%
		96%	97%	97%	97%
		98%	98%	98%	98%
		14%	18%	23%	23%

Table 2: Computer penetration rates in the UK engineering industries.

Size of establishments	No. of new user sites	Acquiring microcomputers	Acquiring larger systems	TOTAL
1-50	4,700	200	700	4,900
50 plus	250	450	700	1,400
TOTAL	4,950	650	1,400	5,600

Table 3: Types of computers to be installed in new user sites in the next 12 months.



From page 22

clearly the market leader, with a 63% market share of computers installed. ICL comes second with 24%. Other vendors share the remaining 13% of the market between them (see Table 8).

Further down the market in medium multi-user systems the situation is more open with five vendors sharing three quarters of the market between them, both in terms of installed equipment and also in terms of equipment acquired in the last 12 months. These five are ICL, IBM, Honeywell, Hewlett-Packard and DEC (see Table 9). The survey indicates that the two vendors gaining the most ground in this

area are IBM and DEC with their 4300 and Vax series of computers respectively.

Further down market again in the small multi-computer marketplace the market is even more open with the top five vendors having less than 50% of the installed base between them (see Table 10). The survey suggests that these top five vendors are losing ground to vendors further down the league table.

It is at the very bottom end of the market, in the microcomputer area, where the most dramatic changes in the various vendors' fortunes are occurring. This area has been dominated by three vendors since the launch of the micro in the late 1970s. These are Com-

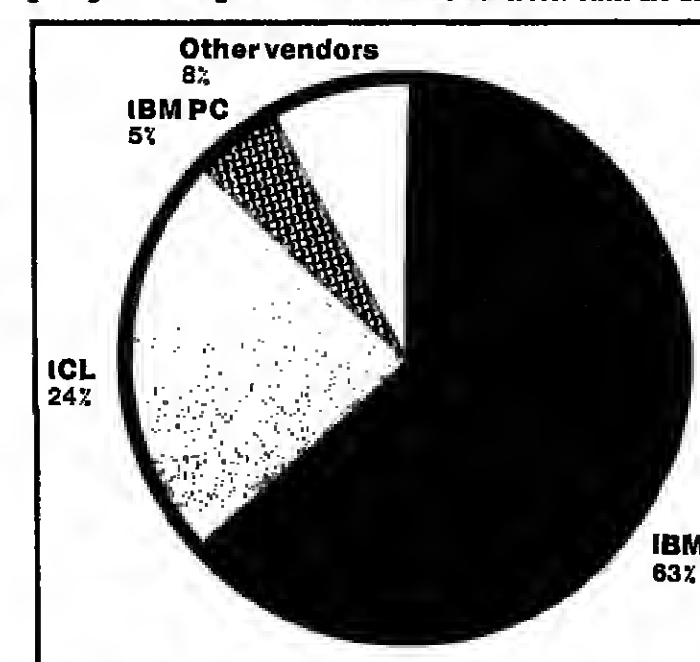


Table 8: Large multi-user systems - vendor market share.

	No. of employees	TOTAL
Payroll	1-24 82% 25-99 43% 200+ 4%	75%
Personnel records	82% 43% 4%	84%
Accounting	89% 67% 45%	84%
Sales/marketing	80% 43% 3%	73%
Budgeting/forecasting	81% 52% 17%	73%
Production/stock control	84% 63% 25%	78%
Technical/scientific	76% 58% 20%	68%
Graphics/design	82% 73% 35%	70%

Table 4: Degree of non-computerisation of applications in different sizes of establishments.

	Large multis	Medium multis	Small multis	Micros
Payroll	H	H	L	A
Personnel Records	H	H	H	L
Accounting	A	H	H	L
Sales/marketing	A	H	H	L
Budgeting/forecasting	A	L	L	H
Production/stock control	A	H	H	L
Technical/scientific	A	L	L	H
Graphics/design	H	L	L	H
Text processing	L	L	L	H

Table 5: Applications performed on different types of computers - proportionate degree of use.

Size of establishment	Establishments with a micro	No. of micros	Micro per establishment
1-10	5,300	5,600	1.06
11-49	4,400	5,800	1.32
50-199	2,100	3,900	1.86
200 plus	1,400	6,900	4.93
TOTAL	13,200	22,200	1.68

Table 7: Systems on which graphics and design applications are performed.

Table 12: Establishments with a microcomputer in the engineering industries.

# Cautious engineers still wait

modore Business Machines (CBM), Apple and Tandy (see Table 11).

The survey shows that, at least in the engineering sector, there is a change afoot with a significant shift away from the traditional microcomputer vendors towards newcomers to this marketplace. The two vendors gaining the most ground are IBM and ACT.

In terms of market share of microcomputers already installed, IBM and ACT have only some 7% of the market between them. When it comes to planned acquisitions in the next 12 months, more than a third of users in the engineering industries, planning to acquire a microcomputer, indicated that they would be acquiring the product of one of those two vendors - an indication of possible upheavals to come in the microcomputer market.

The whole area of microcomputer usage is one of the most fascinating aspects of the whole survey. The survey indicates that, in total, there are over 22,000 microcomputers installed in the engineering industries in the UK, a figure which indicates that the microcomputer has really now arrived.

Also, interestingly, over 50% of those microcomputers are in establishments with less than 50 employees and almost half of those are in establishments with 10 employees or less (see Table 12). In fact, it is the rapid acquisition of microcomputers at the very bottom end of the market which is giving rise to the rapid increase in computer penetration rate in that area, a feature we have already commented upon.

Another useful way of looking at microcomputers, or for that matter, computers in general, is to see them in relation to the proportion of the workforce most likely to use them. This relationship is similar to the one which economists traditionally use in analysing physical capital investment, say, in the car industry.

The greater the physical capital investment per car worker the greater his productivity should be. In similar vein the greater the microcomputer 'muscle power' per office employee, in terms of access to a computer, the more productive he also should be. The survey highlights the ratio between the number of office workers and the number, both of VDUs and of microcomputers, in different sizes of establishments. The results are shown in Table 13.

One of the most significant features which the table highlights is that there are far more VDUs than microcomputers in the user base, particularly in larger establishments where VDUs outnumber microcomputers in the ratio of 10 to 1.

This is understandable given the relatively recent advent of the microcomputer; its relative expense compared to a VDU; its relative weakness, particularly the earlier microcomputers, in a communications environment. All three points, and in particu-

	Installed base
DEC	17%
IBM	12%
Burroughs	7%
ICL	7%
Data General	6%
Rain/ICL	5%
Other vendors	46%
TOTAL	100%

Table 10: Small multi-user systems - vendor market share.

Size of establishment	Establishments with a micro	No. of micros	Micro per establishment
1-10	5,300	5,600	1.06
11-49	4,400	5,800	1.32
50-199	2,100	3,900	1.86
200 plus	1,400	6,900	4.93
TOTAL	13,200	22,200	1.68

Table 12: Establishments with a microcomputer in the engineering industries.

Table 13: Office worker per VDU/microcomputer in different sizes of establishments in the engineering industries.

lar the last, go a long way to explain this dominance of VDUs over microcomputers in sheer number terms in larger establishments.

It also explains why there are actually more office workers per microcomputer in larger establishments than there are in smaller ones. The mental muscle power of office workers in larger establishments is gained more from access to a larger centralised computer via a VDU than it is through a standalone microcomputer.

The distinction between the latest versions of microcomputers and VDUs is, of course, becoming increasingly blurred and it is perhaps useful to treat VDUs and microcomputers as being more or less equivalent. Adopting that approach Table 13 highlights a very interesting but perhaps not too surprising result that, over all, larger establishments in the engineering industries come out best in terms of mental muscle power per office worker.

In fact office workers in establishments employing more than 200 office employees have up to a 3:1 advantage over their colleagues in smaller establishments in terms of computer access.

The main points emerging from the survey are:

■ The degree of computerisation within the engineering industry is still comparatively low with 73% of establishments still not having access to a computer.

■ There is strong evidence that there is a powerful surge towards computerisation, particularly in small establishments where the penetration rate is expected to increase by 50% in the next 12 months.

■ Many of the relatively standard applications are not computerised, even in larger establishments.

■ There is a tendency to use microcomputers for the more specific departmental applications and to use larger systems for corporate applications.

■ There is strong evidence that there will be significant shifts in vendor market share at the microcomputer end of the market with advancements being made by IBM and ACT.

■ The microcomputer is now well established in the engineering industries with over 22,000 of them installed, 25% of which

are in establishments with 10 employees or less.

■ The number of VDUs significantly outnumber the number of microcomputers, particularly in larger establishments.

■ Computer access via VDU or microcomputer is, as yet, still significantly greater in larger establishments than in smaller ones.

Definitions of computer systems used in the survey.

Multiple-user systems: Large systems. Computer systems

costing over £500,000 which 96 or more users can access at any one time.

Medium systems. Computer systems costing between £50,000 and £500,000 which between 16 and 95 users can access at any one time.

Small systems. Computer systems costing up to £50,000 which between two and 15 users can access at any one time.

Single-user systems: Microcomputers costing over £500.

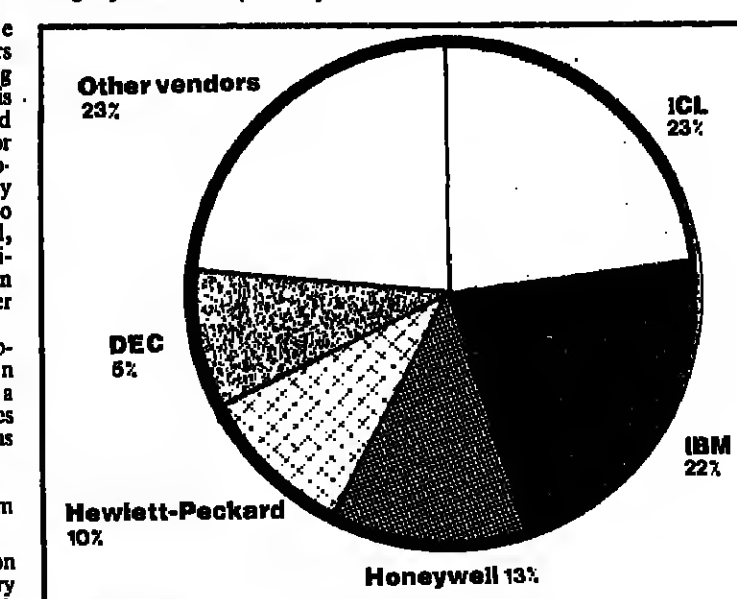


Table 9: Medium multi-user systems - vendor market share.

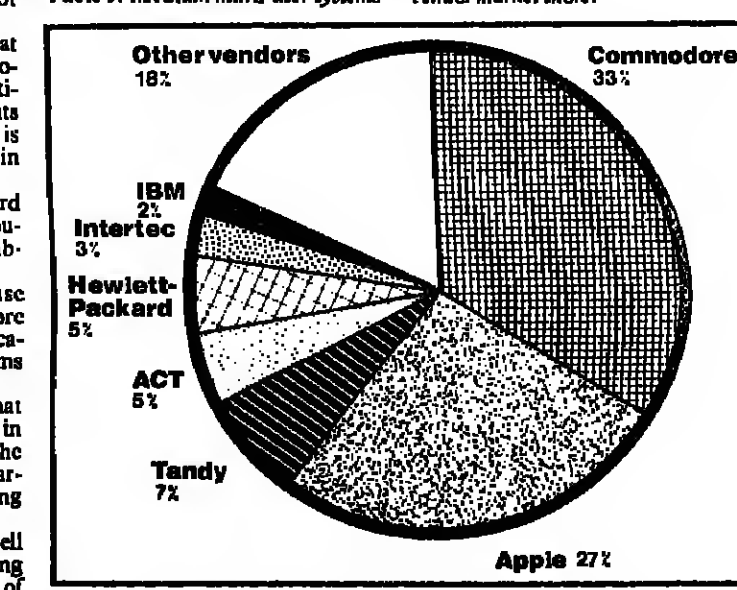


Table 11: Single-user systems, £500-£6,000 - vendor market share.

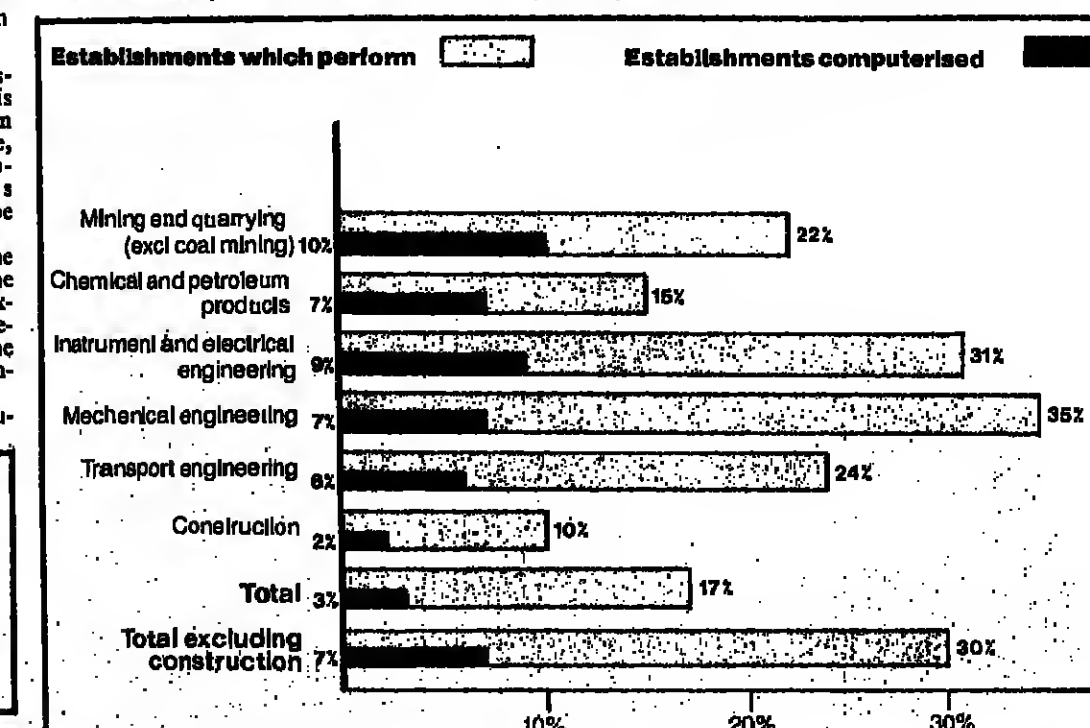


Table 6: Computerisation of graphics and design in the engineering industries.

No. of office workers	Total no. of office workers (000s)	No. of VDUs	No. of micros	Office workers per VDU	Office workers per micro	Office workers per VDU/micro
1-49	618	17,500	14,200	35	44	19
50-199	390	34,100	3,500	11	111	10
200 plus	326	41,000	4,500	8	72	7
TOTAL	1,334	92,600	22,200	14	60	13

Table 13: Office worker per VDU/microcomputer in different sizes of establishments in the engineering industries.







## PRODUCTS



The CIP3 software package from Commercial Graphics.

## Three in one graphics software package

COMMERCIAL Graphics has released a new software package called CIP3 which is made up of three integrated processes.

Up till now, text entry, hyphenation and justification and page make-up have been separate

processes and in most cases required separate peripherals. CIP3 is all three processes combined in a microcomputer which is off-the-shelf.

Just like any other micro it can be used for business purposes

when the CIP3 software is not resident in the hardware.

Commercial Graphics (CW), The Uplands, 145 Manor Road, Littleover, Derby DE3 6BU. Tel: (0332) 372841.

## Brochure on cable form service

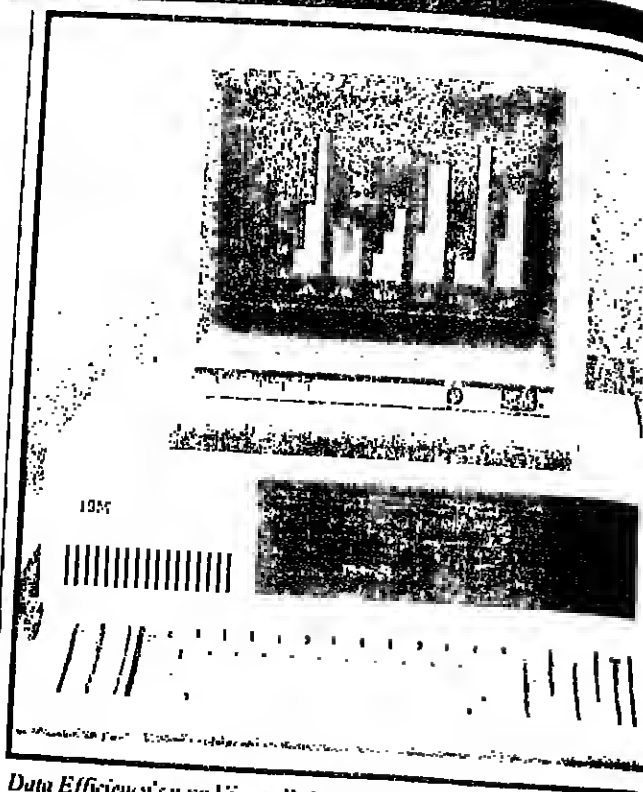
THE cable-form service of H & T Components, Wiltshire's leading connector manufacturer, is laid out in a new brochure.

The service provides top quality plug compatible cable-forms, guaranteed fully tested by H & T Components.

Utilisation of the connector manufacturers' professional service and considerable experience to provide cable-forms ensures highest quality whilst maintaining cost-effectiveness.

H & T Components cable-form service offers a range of benefits to the customer including no-tooling costs, reduced parts inventory, use of approved cables, standard, single or double ended jumper, complete with a professional engineering support unit.

H & T Components (CW), Dunbeath Road, Swindon, Wilts SN2 6EA. Tel: (0793) 693681.



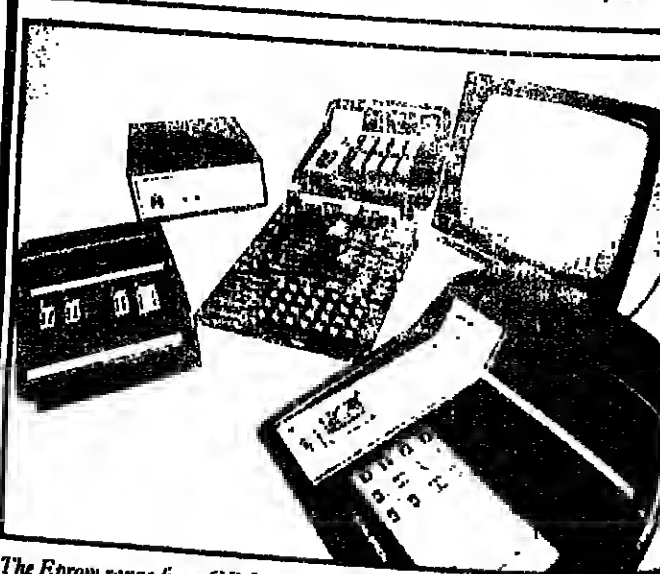
Data Efficiency's new Vision-PC colour system.

## Kaga/Taxan monitor complements IBM-PC

PRODUCED to complement the IBM PC, the new Kaga-Taxan Vision-PC is a high-resolution 12 inch monitor, capable of displaying 2,000 characters. Suitable for computer graphics, due to its faithful reproduction of interme-

diates colours, the new Vision-PC from Kaga-Taxan costs £399, exclusive VAT.

Data Efficiency (CW), Man Road, Hemel Hempstead, HP2 7LE. Tel: (0442) 60155.



The Eprom range from GP Industrial Electronics.

## Programming and emulation with Eprom

A RANGE of Eprom programming and emulation equipment, designed to cater for production and development requirements of engineers involved in microsystem design has been launched by GP Industrial Electronics.

The range centres around three basic Eprom programming and emulation units: the EP-8000, EP-4000 and the P-8000.

Top of the range is the EP-8000, a unit specifically designed to emulate/program all popular NMOS Eproms without any of the personal cards or other expensive extras normally required by other similar equipment. All the necessary software is included, and the machine automatically configures itself for programming or emulating the selected devices.

The EP-8000 also features enhanced video output, which allows the user to view the contents of any block of memory. Data is loaded into the 8K x 8 static RAM from a pre-programmed Eprom, the EP-8000 keypad, the serial or parallel port or an audio cassette.

GP Industrial Electronics (CW) Unit E, Huxley Close, Newham Industrial Estate, Plymouth PL7 4JN. Tel: (0750) 332961.

## Lloyd's brokers get market

A FULLY integrated Lloyd's brokerage product designed to utilise the power and capability of 32-bit superminis has been announced by Perkin-Elmer Data Systems.

Called Market, the system will handle all text processing, risk and claims processing and ledger accounting requirements under Lloyd's rules, yet retain sufficient flexibility to cope with the many varied procedures followed by individual Lloyd's brokers.

A key advantage of the system is its modularity, allowing brokers the option of implementing one or more modules at a time as resources allow, without restricting its eventual integration. This integration means that virtually all information is entered only once, reducing effort and the chances of error. Comprehensive validation routines and full audit trails provide further controls on the integrity of data. The new product has already been the subject of several pre-release orders, the company says.

Perkin-Elmer Data Systems, 227 Bath Road, Slough, Berks SL1 4AX. Tel: (0753) 34511.

## PRODUCTS

## Run CP/M on any computer

DATA General users can now run the CP/M microcomputer operating system on any computer from the Nova 1200 to the MV10000.

The new Mirage 15-inch board from Sintrom Ellinor takes its power from the host computer and can use all standard peripherals, such as discs, printers and terminals.

Sintrom Ellinor points out that this opens up the library of 3,000-plus applications programs written under CP/M to Data General users.

The Mirage board has two Z80A-based microcomputers, both with 64K of memory. It supports two users, but because the additional load on the Data General computer is minimal the number of Mirage terminals can be expanded to 64.

An auxiliary serial port is provided for links between the Mirage and another microcomputer or with a printer.

Programs can be loaded from an external microcomputer or bought from Sintrom Ellinor on Data

General media. The programs are stored on a Data General hard disc in "virtual floppy disc" format. This is a standard file which can be backed up, copied or dumped under Data General's RDOS and AOS operating systems in the same way as other files.

Other software supplied includes a diagnostics routine and a server, which runs under the Data General operating system. The server can be implemented while the computer is running, without the need to bring the system down.

The Mirage is supplied with a CP/M manual and a copy of the licence from CP/M owner Digital Research.

Installation takes less than an hour. The board is plugged into the next available slot and two terminals are reconnected to the cabling panel. The terminals can consequently be switched from microcomputer to microcomputer operation through the keyboard.

Sintrom Ellinor (CW), 14 Arkwright Road, Reading RG2 0LS. Tel: (0734) 875464.



The Orb with hard disc units

## Store hard discs for Orb

ORB, the 16-bit multi-user micro from ABS Computers, is now available with hard disc storage.

The extra disc space is available either in the form of integral or external disc units, which have been designed to fit in with Orb's design and colour scheme.

A 10 Mbyte internal disc drive can now be incorporated. ABS Computers (CW), Portlaine, Brighton, Sussex. Tel: (0273) 421509.

## Rapid brings in graphics display station

AN advanced 19-inch graphics display station, the Envision 239, has been launched in the UK by Rapid Terminals.

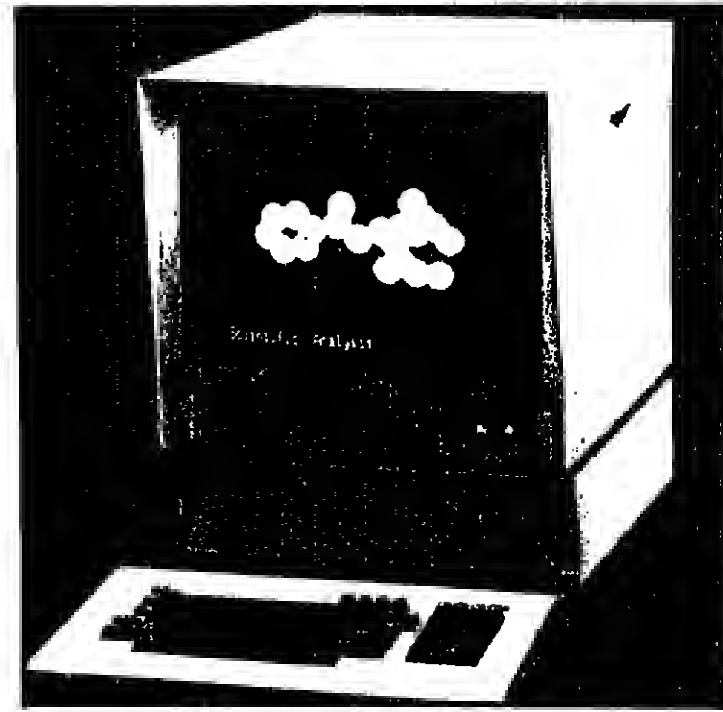
Envision is an American company, exclusively represented by Rapid Terminals in the UK.

The Envision 239 has local graphics processing capabilities and high resolution colour display. It is intended for use in table-top or rack-mount configurations for CAD/CAM, engineering and process applications.

Features include 640x480 pixel resolution, local display list processing, 4,096 colour palette from which 16 colours can be displayed simultaneously, user definable symbols and hardware zoom and pan.

The display is compatible with the DEC VT100 and the Tektronix 4105, and is supported by graphics software packages from Precision Visuals Inc, ISSCO, Megatek and SAS Institute.

The display list architecture of the 239 allows graphics such as vectors, polygons and graphics



The Envision 239 graphics display station.

characters to be stored locally in the terminal, allowing the machine to perform graphic object modifications, transformations and re-drawings, which a host computer would ordinarily have to do.

Up to 6,000 graphics objects can be stored and manipulated locally, expandable to 38,000 objects.

For sophisticated design applications, the 239 allows graphic objects to be grouped into segments. Rapid Terminals (CW), Rapid House, Denmark Street, High Wycombe, Bucks HP11 2ER. Tel: (0494) 26271.



SUM-LC/25 runs on the IBM-PC.

## CAD on IBM-PC

R & H SYSTEMS is launching the SUM-LC/25, a low cost, 2-D computer aided display system designed to run on the IBM Personal Computer. It has been developed for use in electrical, civil and mechanical engineering drawing offices, architectural practices and educational establishments where there is a need to produce accurate drawings in a wide range of scales.

The system is supplied complete with a comprehensive software package, IBM-PC with 64 Kbytes of memory, two 5 1/4 disc drives, colour monitor, a 12in VDU, design tablet and plotter.

With the SUM-LC/25 it is possible to create drawings in colour on the computer screen using a digitiser tablet, joystick or keyboard. Corrections and revisions are made quickly and easily.

New drawings may be assembled from previous drawings if required and the finished drawing may be plotted to any scale.

The SUM-LC/25 is a powerful draughting tool that is easy to use, but also has comprehensive capabilities for the experienced draughtsman. Clear and concise instructions guide the user through the steps necessary to make a drawing. The system can draw all line types, arcs, circles, rectangles, ellipses, regular polygons, Bezier curves, fillets and welds.

It is possible to change any part of the drawing on the screen. Individual objects or extra groups may be moved, copied, rotated, scaled, imaged or deleted. The user can zoom in on any part of the drawing for detail work.

The cost of the system is £12,450.

R & H Systems (CW), Oxford House, Oxford Street, Wellingborough, Northamptonshire NN8 4HG. Tel: (0933) 227477.

## Choose the best portable

A CONSULTANCY specialising in the use of portable terminals has been formed to take advantage of a market expected to grow 50% a year from the mid-80s onwards.

Nydus Consultants says it will help cut the "often lengthy and traumatic evaluation period" that is important for the success of any project. It can also see projects through to the end if required.

Its services cover feasibility studies, requirement specifications, equipment and software selection, system design, market research and training. It expects to expand to take on software development.

Nydus says it is in close contact with all portable terminal manufacturers, monitoring the market and evaluating latest products, including radio and infra-red transmission devices.

The company points out that prospective users have over 100 portable terminals and computers to choose from.

Nydus Consultants (CW), Victoria House, 411a London Road, Camberley, Surrey GU15 3HZ. Tel: (0276) 681027.



Cunard International Hotel, London  
January 31 - February 2, 1984  
10.00 - 17.30 (closing 16.00 on the last day)



## Especially for the computer professional

Peripherals '84 is the central event in the computer peripherals industry's calendar, because it offers the specialist visitor like you, an opportunity to see the very latest equipment on offer from the manufacturers.

Only at a show dedicated to peripheral equipment including terminals, printers, disk drives and plotters, could you see the wide range of cost effective equipment available today to the professional computer buyer.

The show's professionalism is guaranteed by the joint sponsorship of the industry's

own trade magazine, Systems International, and the Peripherals Suppliers Association. A simultaneous programme of seminars is held by the Peripherals Suppliers Association in recognition of the central place this prestigious exhibition holds in the peripheral industry. For full information of the seminar programme telephone Mrs Helen Gibbons on 0763 71209.

Both the show and the seminars are held at the Cunard International Hotel, Harpersmill, itself close to the centre of

London and within easy reach of Heathrow Airport. Peripherals '84 is organised by Reed Exhibitions which also stages other major computer related exhibitions including Compex, Software and The Computer Trade Show.

So if you're looking for the peripheral market make sure you visit Peripherals '84 and discuss your needs with specialist suppliers. It's the central event for peripherals.

Return coupon to: The Exhibition Managers, Peripherals '84, Reed Exhibitions, Surrey House, 1 Throby Way, Sutton, Surrey SM4 4QQ. Please send me information on Peripherals '84 seminars.

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# The Computer Trade Show '84

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If you want to talk to buyers then The Computer Trade Show '84 is the central way of reaching an audience of the highest quality. Only bona fide trade visitors are admitted to the show and at the last exhibition 3,653 trade buyers came to The Computer Trade Show. Such people are serious business buyers, with 41 per cent of 1983 visitors involved in computer equipment for systems integration and 25 per cent looking for OEM equipment for systems integration.

This impressive audience attends The Computer Trade Show because of the guaranteed quality of the show. Held near the centre of London at the modern Wembley Conference Centre with its sophisticated businesslike atmosphere, it is staged by the country's largest exhibition organisers, Reed Exhibitions. Sponsors of the show are Computer Weekly, Systems International, Software, Practical Computing and Micro Business.

A prestigious conference programme held in conjunction with the show is certain to attract wide media coverage and issues discussed to depth, the conference will be the talking point of the year in the trade. For further information contact Christine Jones, Tel: 01-643 8040.

Reed Exhibitions has organised an impressive promotional programme for The Computer Trade Show '84 with direct mailings to selected visitors to the COMPEC series of exhibitions and to the entire circulation of the sponsoring magazines. Editorial previews of the exhibition in the sponsoring journals will ensure that interest in the show is at its height in the crucial period just prior to The Computer Trade Show '84.

With this kind of backing it is no wonder that an important number of computer companies, like Digital Equipment Company, Perkin Elmer, Kodak, Norsk Data, General Automation, Rediffusion, Geveke, Newbury Data and Multicomputer, have already booked stand and space at the show. So if you want to be sure of meeting thousands of business buyers with bulk stand space at The Computer Trade Show '84 by clipping the coupon below, or better still phone Gillian Johnson on 01-661 3129 NOW!

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## High-speed modem family

A FAMILY of new generation modems utilising the latest state of the art technology has been introduced by Paradyne.

The family comprises the MPX2400, the MPX4800 and the MPX9600.

The MPX2400 is a high-speed 2400 bps synchronous modem for use in point-to-point or multipoint applications over unconditioned four-wire leased circuits. The modem is CCITT V.26 compliant and has a full back rate of 1200 bps.

The MPX4800 operates at 4800 bps synchronously and is designed for use in point-to-point or multipoint applications over unconditioned four-wire leased circuits.

The top-of-the-line MPX9600 operates at 9600 bps synchronously, and is CCITT V.29 compliant when operating point-to-point configurations. It is also strap selectable for "rapid poll" operation. This permits operation in a multipoint configuration with a RTS/CTS delay of 20 ms.

Paradyne (UK) (CW), Paradyne House, William Street, Windsor, Berks. Tel: Windsor 56712.

## 216 Mbytes storage on extended range

The Dialog Winchester controller.

THE Distributed Logic Corporation (Dialog) of California has now extended its range of 5 1/4 in Winchester controllers to enable up to 216 Mbytes of online mass storage to be available on a single DEC LSI 11 microcomputer. Until recently 40 Mbytes was the maximum available.

The new product, the DQ615, is claimed as the first controller able to support two Maxtor XT-1000 Winchester disc drives, each having 112 Mbyte capacity. The combination reduces the cost of mass storage on a DEC mini which brings the management of large files within the economic reach of the smallest companies.

The breakthrough has been achieved by using an RK06/07 emulation with a standard ST506/ST412.

The DQ615 controller also incorporates Dialog's Universal Formatting technique, which allows any two disc drives compatible with an ST506 interface to be controlled, even if of different capacity and configuration.

The DQ615 is software transparent to DEC's RG-11, RSX11M, RSTS and Bell Laboratories' Unix operating systems.

Dialog International (CW), 12 Temple Square, Aylesbury, Bucks HP20 2QL. Tel: (0296) 34319.



Calcomp's new graphic development system.

## Calcomp makes some graphic developments

THE next stage of Calcomp's drive into the raster scan graphics display market comes with the announcement of the graphic development system, GDS 4000.

Calcomp says the GDS 4000 is designed to enable OEMs and system designers to develop cost-effectively distributed graphics applications software for systems utilising Calcomp Vistagraphics 4000 raster scan displays.

A standalone graphic computer, GDS 4000 includes a high resolution raster scan colour graphics display, fixed/removable disc storage, a real time multi-tasking operating system and a complete set of software tools such as editor, micro assembler, compilers, utilities and support routines.

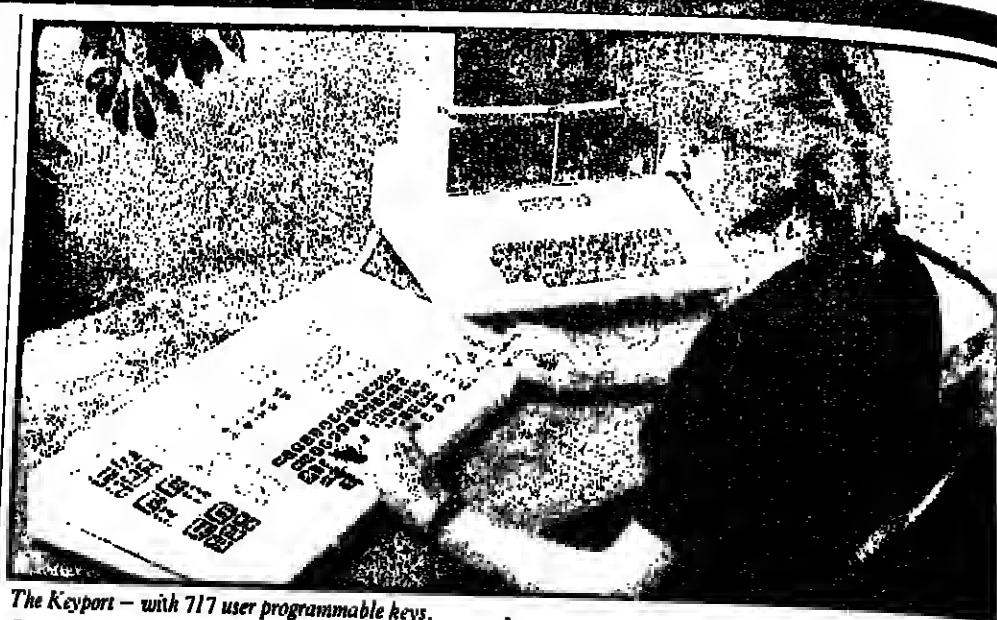
The Vistagraphics 4000 Series graphic display terminals are based on dual Motorola MC68000 16-bit microprocessors and incorporate a double display buffer which provides real time dynamic graphics by eliminating screen blanking during image updating.

Other key features include a choice of display resolutions up to 1024x1024, up to one megabyte of RAM, up to 20 megabytes of disc storage and up to eight planes of display memory with a look-up table, providing as many as 256 simultaneously displayable colours from a palette of 4096 colours.

Most models in the range use non-interlaced display for flicker-free images and a selection of host interfaces and I/O devices, such as trackballs, joysticks, digitiser tablets etc, is also available.

The Vistagraphics system can operate both as a standalone unit or as part of a fully distributed graphic system.

Calcomp (CW), Carr House, The Ring, Bracknell, Berkshire RG12 1ER. Tel: (0344) 50211.



The Keyport 717 user programmable keys.

## 717 user programmable keys

GCS Communications claims that its Keyport 717 eliminates many of the instructional keystrokes that system designers and programmers have to make when using a conventional microcomputer keyboard.

Keyport 717 is a flat membrane keyboard with 717 user programmable keys.

Each application program uses a

different flexible plastic coloured overlay to display the active keys. A typical application uses between 150 and 300 keys. The function of each active key is indicated on the overlay by words, symbols or pictures on and around the key itself.

Programming is simplified by eliminating menus and syntax analysis. Once the program has been written the user can see,

select and enter commands without any referral to the application manual. Complex commands or menus are reduced to the touch of a single key.

GCS has priced the Keyport at about £200.

GCS Communications (CW), Orion Park, 226-236 Northolt Avenue, London W13 9QU. Tel: 01-579 9401.

## PRODUCTS

### IBM adds colour for designers

IBM has announced the 5080 Graphics System which offers high function interactive graphics in colour to CAD/CAM users.

The system is designed for ease of use with substantial application flexibility and configurability.

Designers and engineers working on complex drawings, such as circuit board designs, can benefit from the greater separation of detail that colour can bring. It provides high performance, advanced 3-D transformation capability with programmable line types, area fill and programmable pattern generation within the terminal.

The system comprises 5088 graphics channel control unit; 5085 graphics processing unit; 5081 display monitor unit with alphanumeric keyboard, program function keyboard and 5083 tablet and stylus (or cursor); and GAM/SP Release 2 Graphics Access Method/System Product which supports the full range of functions of the IBM 5080 graphics system.

The IBM 5081 display offers a selection of up to 256 colours.

The 5080 is available in colour and monochrome screen versions.

Each 5081 terminal is provided with a 128K memory as standard with a maximum memory per terminal in excess of one megabyte.

Since the 5081 is a raster unit, the monitor is flicker-free even when complex pictures are displayed.

Under Cadam two colour modes are available on 5080: elemental colour mode and overlay mode.

Both offer 11 colours to the user while five are reserved for use by the Cadam program.

Under Catia 16 colours (two are reserved for Catia) are available and in CAEDS the operator can use 16 pre-defined colours or define names for up to 256 colours.

A system comprising four 16-colour displays costs £92,307.

IBM (CW) PO Box 41, North Harbour, Baltic House, Portsmouth PO6 3AU. Tel: (0705) 694941.

## Colour display generator '35 times faster'

A MODULAR, software-based, configurable colour graphics display generator, the Ramtek 2020, offers 675,000 short vectors per second, 35 times faster than conventional systems.

Capable of single or multi-channel operation, the 2020 can be configured as an extremely fast, high-resolution graphics peripheral for various display requirements, or as online interactive display system with local processing capabilities.

The system is designed for applications such as military command and control, CAD/CAM, seismic exploration, process control and any other application requiring high resolution and performance.

The modular, software-configurable approach of the 2020 is Ramtek's solution for the user who wants to keep pace with the new technology. Because he is not locked into a particular hardware design, the user can upgrade the

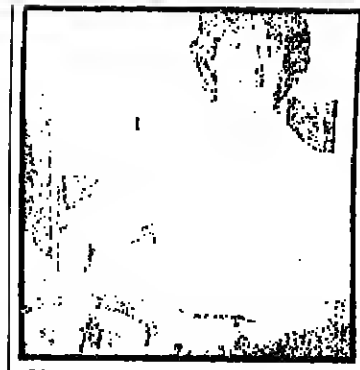
system at any point by programming new diskettes.

Designed with pipelined, parallel co-processors and a 32-bit VME bus structure, the 2020 features a sophisticated writable control store implemented in RAM. An internal communication system allows any processor (Module) in the system to communicate with any system component.

A 3.5in micro floppy on the VME bus allows the user to customise the system by augmenting operating software with custom software developed for a particular application.

The 2020 configurations use multiple MC68000 microprocessors. Complex bit manipulations are handled by 2900 family hitless processors. Vectors are drawn at 37.74 nanoseconds per pixel.

Ramtek (UK) (CW), Snaprogetti House, Basing View, Basingstoke, Hampshire RG 21 2TY. Tel: (0256) 69541-8.



Shannon Datator offers a full range of Nashua hard discs.

## Firm offers disc range

SHANNON Datator is offering a full range of Nashua hard discs for use with all the major manufacturers of minicomputers.

Front loading and side loading cartridges and multi-platter hard disc packs are available and all are designed to meet or exceed all known industry specifications.

The range is 100% certified error free by the manufacturer and is covered by a five-year guarantee.

Prices start from £44.50 for cartridges and £170 for disc packs.

Shannon Datator (CW), 36 Croydon Road, Beckenham, Kent BR3 4BH. Tel: 01-650 4818.

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Ferranti also supplies software packages for major applications such as word processing and spreadsheet calculations. Of course the Argus Pro-personal can also run your existing 8-bit software.

It adds up to all the power and capacity you need. Benchmark tests have proved it outperforms its competitors.

### A COMPLETE PACKAGE PUTS YOU ONE UP

Right from the start the Argus Pro-personal gives you what you want. CPM-86 and BASIC are included. So is 128K of memory - and it's all available to you because the VDU has its own memory for both alphanumeric and high resolution graphics.

Check this out against the competition.

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looking, with clear characters on an anti-reflective screen. The VDU tilts and swivels, and the keyboard, VDU and processor box can be placed to suit the operator.

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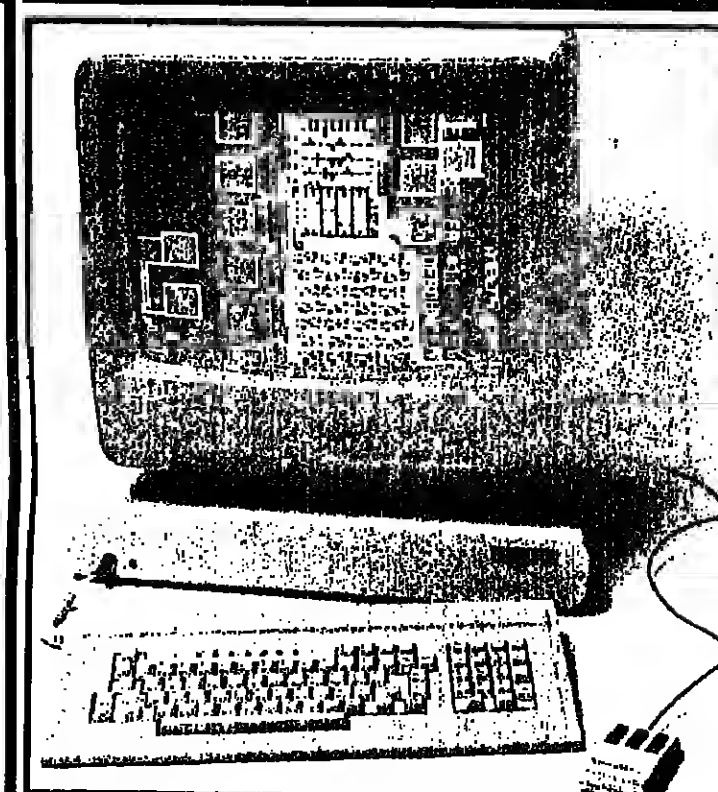
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CWNR 10/11



The AED 1024 colour graphics terminal from Dicoil.

## Terminal can show up to 256 colours

A POWERFUL colour graphics terminal with a high resolution display screen, the AED 1024 has been introduced by Advanced Electronics Design and is now available in the UK from sole distributor Dicoil Electronics.

The AED 1024 is aimed at applications such as CAD, manufacturing and engineering, process display, simulation, graphics arts and medical display.

Its high resolution screen, 1024x768 pixels, gives precise and smooth colour drawings, the company states. The terminal's anti-aliasing feature and its 1024x1024x8 virtual address space further refine any screen display. The anti-aliasing feature also eliminates the jaggedness of the displayed lines.

A total of 256 colours can be displayed simultaneously from the AED 1024's palette of 16.8 million colours. This feature makes the terminal specially suited to CAD/CAM and graphic arts applications.

The AED 1024 can also emulate the Tektronix 4010 family of storage tube terminals, enabling AED terminal users to take advantage of the vast amount of software available for the Tektronix displays.

The system is compatible with AED's 512 and 767 colour graphics terminals, also supplied by Dicoil. All applications software for these terminals will run on the higher resolution 1024. The character font set will accommodate an 80x25 alphanumeric display format, allowing fully formed characters to be displayed in an alphanumeric mode.

A greeo drafting grid, at selectable intensities, can be turned on and off without affecting the image on the screen.

The AED 1024 has eight memory planes allowing users to create layered designs of any kind of complexity, from multi-level VLSI circuits and PC boards to architectural schematics and detailed images. Each plane can be masked from the others to simplify the image.

A programmable zoom function, with up to 16 stages, and horizontal and vertical scrolling are also among the features.

The AED 1024 sells for £11,000.

Dicoil Electronics (CW), Bond Close, Kingsland Industrial Park, Basingstoke, Hants RG24 0QB. Tel: (0256) 61551.



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after 5 p.m. and at weekends, or write to Colin, quoting reference 329/61, at  
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**FERRANTI**  
Selling technology



## Management Services Manager

Civil Engineering Contractors - South London

Our client, a large civil engineering company, is part of a major British group.  
This senior position, which reports at board level, will interest a computer specialist  
who has experience of both mainframe and micro-computers, preferably in a related  
industry. He or she will analyse and develop the company's already extensive systems  
and, as head of a small team, provide a complete management information service.  
Although based at our client's South London head office, there will be considerable  
UK travel, supervising the installation, use and development of on-site terminals.  
To meet the demands of the position you will probably have at least 10 years'  
experience, including two-thirds at a supervisory level, backed by sound educational  
qualifications.

Salary is negotiable, according to qualifications and experience, and benefits appropriate  
to a major organisation.

Please write with full cv. to Confidential Reply Service Ref. CSM8831, Austin Knight  
Advertising Limited, London W1A 1DS.  
Applications are forwarded to the client  
concerned, therefore companies in which  
you are not interested should be listed in  
a covering letter to the Confidential Reply  
Supervisor.

**Austin  
Knight  
Advertising**

## APPLICATIONS PROGRAMMER

(Software Technician)  
Grade Scale 4/6 £8,881-£8,493

The West London Institute of Higher  
Education intends to make rapid  
 strides in the field of computer edu-  
 cation and information technology. To  
 increase our impact in these direc-  
 tions we require a highly motivated,  
 enthusiastic and competent person to  
 advance software development.

The post offers extensive opportuni-  
 ties for the individual appointed to  
 bring his/her ideas to fruition in the  
 design and implementation of new  
 commercial, academic and adminis-  
 trative applications.

The ideal candidate will have at least  
 two years' experience of BASIC on a  
 R.E.C. VAX machine operating under  
 VMS, a good knowledge of PASCAL  
 plus the ability to communicate with  
 non-computer specialists.

If you would enjoy the challenge of  
 this very varied job then please tele-  
 phone or write for application form  
 and further details from - Assistant  
 Registrar (Personnel), West London  
 Institute of Higher Education, Gordon  
 House, 328 St Margaret's Road,  
 Walsingham, Norfolk NR1 1PT. Tel: 01-  
 891 0121 Ext 222.

Closing date for return of applications  
 forms 20th January, 1984.

**WEST LONDON  
INSTITUTE OF  
HIGHER EDUCATION**

## SHARPEY-SHAFFER CENTRE WEST LAMBETH HEALTH AUTHORITY CHIEF SYSTEMS DESIGNER (Scale 23) £12,880-£15,981 + ADP Allowance SOFTWARE MANAGER (Scale 18) £11,435-£13,657 + ADP Allowance (Both inclusive of London Weighting)

The Centre specialises in health care management and clinical  
information systems. It currently provides a service via an exten-  
sive terminal network using a Honeywell Signis 6. A fully distri-  
buted network is being implemented using an Ethernet Local Area  
Network to which various designs (eg, a twin GEC-4190 and various  
microcomputers) are being attached.

Vacancies exist for two senior posts within the Centre. For the Chief  
Systems Designer post, applications are invited from candidates  
who have both expertise in application systems design and the  
ability to plan, co-ordinate and control all aspects of the many  
transfer and development projects in which the Department is  
engaged. The Chief Systems Designer deputises for the Director in  
his absence.

For the Software Manager post, candidates will be expected to  
have wide experience on various systems from mainframes to  
micros and will have proven management experience. Experience  
with telecommunications networks would be an advantage. The  
Software Manager is responsible for all systems software and  
programming within the Department.

For both posts, an ADP allowance of up to £554 may be payable.  
For application form and job description, contact the Personnel  
Department, St Thomas' Hospital, Lambeth Palace Road, London  
SE1 7EH. Telephone: 01-923 3282 ext 2422.

For informal discussions, please telephone Dr A. V. Stokes, Direc-  
tor of Computing, on 01-923 3282 ext 2713.  
Closing date: January 19th, 1984.

## TOP JOBS

## BUSINESS DEVELOPMENT EXECUTIVES

On target earnings circa £30K plus company car and benefits.

- The Job:** To spearhead the business expansion of a medium sized systems house through the use of strong  
interpersonal and entrepreneurial skills. The task will involve the formulation and achievement of  
business plans, prospective and existing client account development and management, contract  
negotiation and problem solving in all aspects of the company's business, particularly in relation to  
financial markets.
- The Company:** Despite a low market profile the company has achieved steady growth throughout its 12 year  
history, and has amassed a good capital base with which to fund the proposed expansion drive.  
Previous clients include many well-known corporations and the company has an enviable record of  
success in project implementation.
- The Requirement:** It is essential that prospective candidates should be able to demonstrate a track record of  
successful selling within the computer industry - particularly interesting would be experience of  
financial business sector sales. They should be self motivated business men or women who have an  
innate understanding of how to manage and develop opportunities, overcome problems and  
minimise risk of failure. They should have intuition, imagination and diplomacy and a willingness to  
work within a managed team structure. Above all they must be totally committed to the rapid  
expansion of a company in line with current industry expectations.
- The Reward:** First you will be working for a company which appreciates the benefits of employing excellence.  
Second you will be presented with personal challenges and involvement at a senior level. Third you  
will be actively encouraged to develop your skills and abilities.  
Naturally the salary package will reflect your value to the company and should be a matter for  
negotiation at interview. However the company has never experienced difficulties in meeting the  
financial requirements of candidates it wanted to employ.
- Location:** Positions exist in both London and Bristol. In each location offices are situated centrally and have  
ready access to good rail and/or tube communications.
- The Next Step:** If you feel that you could meet the exacting requirements of these positions and would enjoy the  
challenge, involvement and career development that the company can offer, then please contact  
Chris Morrow on 01-837 0451 (days) or 01-267 9409 (evenings after 7.00pm) for an informal  
discussion.

**TOTAL  
SELECTION  
LIMITED**  
388, City Road, London EC1V 2QA

# 01-837 0451

01-837 0451



## Analyst/ Programmers

**Walton-on-Thames, Surrey**  
**Salaries to £10,500**  
**Leading Food Manufacturer**  
**and Brand Leader**

This is an unusual opportunity, one that offers someone with around 2 years' experience a very good chance of developing skills and experience in a highly professional data processing environment.

Our client is the market leader in their field. They use a wide range of IBM hardware and are now looking for Analyst/Programmers to join their management services development team. They are far more interested in the person than in past analysis or hardware experience. Someone who would like to move into the IBM area could well be a quite serious candidate. Please consider the following points:

- \* You must have between 18 months and 2 years' experience as an Analyst/Programmer.
- \* You must be prepared, if you are an analyst who doesn't have programming experience, to acquire it. The proper training will be given.
- \* You must be able to work in a small team. However, at the same time, you will be expected to use your initiative.
- \* You will see the significant advantage that this opportunity presents. Usually companies look for applicants with both relevant hardware and systems experience. Here, this is not the case. The client is far more interested in the potential of the individual.

Our client uses PL/1 with Mantis and Easytrieve and is well aware of the advantages of exploring and using new technology.

Their offices are based in a most attractive part of Surrey, working conditions are of high order and the career opportunity could be very good indeed. There is a sensible promotion path and this will be very clearly explained at the interview.

In the first instance please contact John Goldsmith, quoting Reference Number 421, on 01-631 4184 or write to him at: A & A Consultants (Holding) Ltd, County House, 10 Little Portland Street, London W1N 5DF.



## SYSTEMS DESIGNER/ANALYST

to £14,000 per annum.

We have an interesting opportunity for a talented designer to join a growing systems house based in the City.

The application areas are mainly financial and it would obviously be an asset if candidates had previous City financial experience, however we do not rule out the likelihood of proposing candidates from other backgrounds.

This position will suit a d.p. professional who is either currently a systems analyst/designer or alternatively an analyst programmer who wishes to move into a more demanding role.

If you feel that you have the personality and strength of character to handle a challenging role in a fast moving environment then please contact Chris Morrow on 01-837 0461 for further details.



388, City Road, London EC1V 2QA

**01-837 0451**

## HAS YOUR CAREER REACHED A BOTTLE NECK?

*Know the feeling?*

All bottled up with enthusiasm and eager to go places but in a job that's bottled you up in one place with little hope of advancement.

So we don't want you to be put off when we say that at Kalamazoo we've got a lotta bottle... because it's our own success we're referring to! As a result that means new opportunities in sales on a nationwide basis. Which is where you come in.

We're offering you the potential to make yourself a rewarding and challenging career as part of our talented Sales Force - selling specialist business systems to British industry. Our product range covers everything from stationery to computers - it's a successful growth industry, so there's plenty of room for your career to grow.

Whether you're an experienced sales pro. or a newcomer to the field our training programmes will give you a strong background for a high powered career.

If you're aged over 23, with 5 'O' levels or equivalent and have the enthusiasm and determination to win, you will be rewarded with an excellent salary package (realistic first year earnings £10,000, top earners exceed £20,000) and you will receive a company car plus a wide range of big company benefits.

All this and nothing to hold you back! So get out of that bottle - before someone puts the cork in!

Contact us on Freephone 4564 now, or write with CV to Bryan Jones at - Kalamazoo plc, Northfield, Birmingham, B31 2RW.



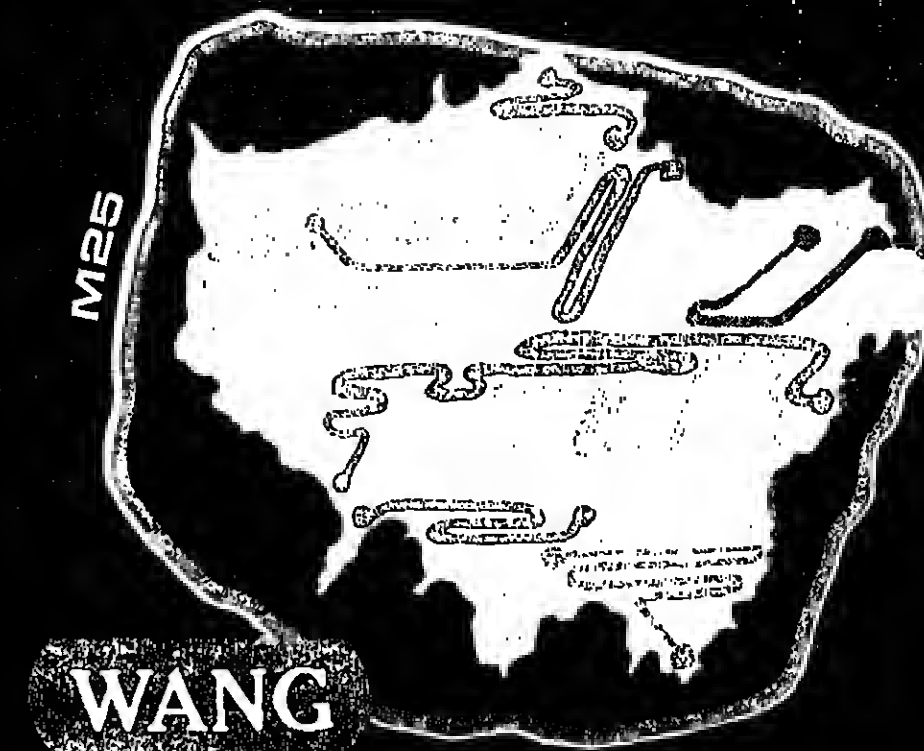
**Kalamazoo**  
business systems

# MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

## CUSTOMER ENGINEERS

### £9-£13k PACKAGE + CAR



The Office Automation Computer People.

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

**MANAGEMENT &  
EXECUTIVE SELECTION**

WANG's technical excellence across a large and varied product range of W.P. systems, 16 & 32 bit DP systems and network communications, has enabled them to achieve consistent and unparalleled growth in today's computer industry with sales in excess of \$100 million in the UK alone.

We are looking for high calibre post sales Customer Engineers to join a company that has a large commitment to maintaining this phenomenal growth through ongoing development, of sophisticated hardware and software products. WANG's philosophy is to recognise the career aspirations and needs of the individual, to offer comprehensive training, an excellent benefits package and technologically advanced products.

If you possess two/three years' experience maintaining minis/micros, hard discs and other associated peripherals with customer skills to match, and wish to join the company of the future,

ring Chris Bond or Kirk Blackmore on 01-637 9611.

## INTEL SYSTEMS - CAREER OPPORTUNITIES FOR SOFTWARE SPECIALISTS

INTEL, inventor of the microprocessor and acknowledged leader of the microcomputer industry, is making a major thrust into the computer systems business. The product range is based on the most sophisticated microprocessor products of which Intel is the world's largest supplier.

A key element of this programme is the new EUROPEAN TECHNICAL CENTRE, based at Swindon, which is being established to support customers of our advanced systems products. These range from professional software and hardware development systems to OEM products covering a wide spectrum of commercial applications. We are looking for experienced Systems Software Engineers who relish the chance of joining an exciting project in its initial phase.

Successful candidates will be presented with a rare career opportunity to operate at the forefront of technology. Some travel within Europe and the USA will be required and the necessary training will be provided. Our immediate needs are in four primary product areas.

- \* **DATA BASE MANAGEMENT SYSTEMS** - Opportunities exist for Software Specialists to provide post sales technical support on our advanced data management systems which operate under several Operating Systems. Candidates should be experienced in Systems Programming on IBM, CDC, or Univac mainframe computers although similar experience with other mainframe environments will be considered.
- \* **RMX SYSTEM SOFTWARE** - The RMX product line provides the necessary building blocks to design real time operating systems for our major processors. The RMX operating systems will be extended to work with future processors, maintaining Intel's market leadership. Applicants are required to

have experience in the development of RMX based systems or in the design of unique RMX I/O routines.

- \* **XENIX** - To support our penetration of the commercial systems market we require Specialists with expertise in XENIX and 'C' programming. This post would ideally suit a recent University Graduate with 2-3 years XENIX experience.

- \* **SOFTWARE LANGUAGES AND COMPILERS** - Opportunities exist within our newly formed European Technical Centre to support our high level languages and assemblers, ie PL/M 88, Fortran and Pascal. In depth experience extending over a period of 3 years is desirable.

Successful candidates should be prepared to spend training periods in our European and US facilities.

Our conditions of service match the excellence of our staff and products. Our benefit package is amongst the best in the industry and matches the high expectations we have of our employees - competitive salaries, non-contributory BUPA, life insurance, pension and stock participation plans, plus a generous relocation package where necessary.

If you are looking for a challenging and rewarding career with real prospects for rapid advancement, don't miss this opportunity to join INTEL - the technology leader.

We are continually seeking good people to support our expansion, so by all means call us to see if your experience may suit other positions within the Company.

Ring our hotline on Swindon (0793) 78444 between 9.00 am and 8.00 pm on Friday, 6th January 1984 and ask for Ray Withey or Alan Court. Alternatively, write to or phone Ray Withey, giving details of your career to date to: Personnel Department, Intel Corporation (UK) Ltd, Pipera Way, SWINDON SN3 1RJ. Tel: (0793) 486388.

These vacancies are open to male and female applicants.

**intel**

DELIVERS  
THE FUTURE

\* Intel investment in UK will double by 1986

\* Intel UK needs to double its UK staff by 1986

Intel Corporation (UK) Ltd,  
Pipera Way, Swindon,  
Wiltshire SN3 1RJ.  
Tel: Swindon (0793) 486388.





# HIGH TECH Opportunities in Lancashire

CIRCA £9,500

Our client is one of Europe's leading Companies in the design and manufacture of high quality precision printed wiring boards. Since its foundation in the 1970s, the Company has grown at a consistently high rate and future plans envisage the continuation of this expansion. Indeed, the recent acquisition of a further manufacturing facility is evidence of a firm commitment to the future.

The Company assigns a high premium to the contribution made by the Computing Department to the efficiency of the business, and are undertaking a continuing programme of investment in up to date equipment and technology. Currently, the installation comprises Data General MV4000, CI50 and Nova equipment, which are all linked by means of a local area network to the workstations within the Company.

In order to support the next phase of growth, the Company now wishes to expand its Development Team and therefore requires the following computer professionals.

## Analyst Programmers

The Analyst Programmers will work closely with the respective Project Leaders and their responsibilities will include detailed program design, implementation and liaison with users.

## User Support Analyst

The role of the User Support Analyst is to provide a comprehensive support service answering queries, providing advice and helping the users to get the best out of the systems.

For all of the positions, the ideal applicants will be well-educated and possess 2 to 3 years' experience in a manufacturing environment. Application areas of particular interest include work in progress, stock movement, sales and works order processing, product information, and production planning.

As the Company wishes to make use of 4th Generation application development software, a knowledge of database techniques will be most welcome and also for one of the Analyst Programmer positions a sound exposure to CAD/CAM techniques would be an advantage.

For all these positions a salary of circa £9,500 will be offered, together with the sort of benefits to be expected from a go-ahead Company, including a profitshare.

These are genuine opportunities to become part of an exciting and challenging development, working in a high technology environment within very pleasant surroundings in Lancashire.

For more information and to arrange an early interview, contact JOHN WHELAN on 061-833 0427 (24 Hour Answering Service) or 0625 520708 (Evenings 7-9 p.m. and Weekends) or, alternatively, write to me at the Manchester Office address shown below.

Technical, Sales & Management Appointments

Specialist Computer Recruitment Ltd

**SOUTH**  
James House, 40 James Street,  
London W1M 6PS  
01-838 8671/488 0481

**MIDLANDS & INTERNATIONAL**  
36-37 Great Charles Street,  
Quintonway, Birmingham B3 3JY  
01-236 3761

**NORTH**  
International House, 84 Deansgate,  
Manchester M3 2EE  
061-833 0427

**BELOUV**  
Avenue Louise 327,  
B-1050 Brussels,  
010 222-840 7151/71

**HOLLAND**  
Waterlooplein 22  
1071 AS Amsterdam  
010 2120-7609/17

# PROJECT MANAGERS

To £20,000 p.a. plus car and benefits.

## The Job:

To manage the development and installation of a wide variety of software systems on a bespoke and package basis within the financial and commercial sectors. Duties include client liaison, consultancy studies, estimation of project duration and production of tenders, as well as the overall control of teams of personnel.

## The Company:

A systems house with an excellent reputation for the quality of its products and systems and a good growth record throughout its history. The current recruitment drive is regarded as essential to the continued expansion of the business and the successful candidates will be expected to make significant contributions to the formulation and achievement of future business plans.

## The Requirement:

It is essential that prospective candidates should have had considerable experience of project management and that they should be able to demonstrate a track record of successfully implementing both large and small scale projects. In addition it is of considerable importance that they should have a fundamental understanding of commercial requirements and sufficient business acumen to negotiate effectively at a senior level with clients. Moreover, they should be stimulated by the challenge of assuming profit responsibility in a highly competitive industry. Previous systems house experience would be an asset but we would be interested in hearing from people outside that environment who feel that they could make a contribution in the role described.

## The Rewards:

The successful candidates will enjoy challenge, responsibility and an ever changing environment in which to use their skills. Remuneration will be by way of a high basic salary, a Company car and benefits. In addition there will be the opportunity to participate in the Company profits by way of a bonus scheme.

## Location:

The position is based in London.

## Interested?

Then please telephone Chris Morrow on 01-837 0451 for further information.

**TOTAL  
SELECTION  
LIMITED**

388, City Road, London EC1V 2QA

01-837 0451

هذه اذنه الاجل



## FREELANCE OVERSEAS OPPORTUNITIES THE ARABIAN GULF

For more information £15K to £30K. Free accommodation, sports facilities, medical services, air fares, etc. Choose from these opportunities.

**SAUDI ARABIA** Work for the world's largest oil producer, with the latest IBM equipment.

- BUSINESS ANALYSTS** Design, develop, implement a major personnel and payroll system. 10 years' DP experience.
- SYSTEMS ANALYSTS** Course development. Develop classroom and computer-leased courses especially for Arab staff. Three years' DP education. Five years' DP technical knowledge.
- CLASSROOM INSTRUCTOR** MVS, JES2 Operations. Familiarity with 3081 environment.
- ANALYST PROGRAMMERS** Both commercial and scientific. Over five years' DP, PL/1 or Fortran, TSO/SPF. Large IBM background.

**ABU DHABI** Also in an oil environment - pleasant lifestyle.

- DATABASE DESIGNER/ADMINISTRATOR** MVS, DL1, minimum 10 years' DP.
- OPERATIONS SUPERVISOR** 4341, VM DOS/VSE
- SENIOR PROGRAMMER** COBOL, DL1 IDOS or OS
- INSTRUCTOR** VM, CMS Systems

**QATAR** A comfortable university environment, with all facilities

**PROGRAMMERS + ANALYST** Arabic-speaking, with academic/university backgrounds

For further details contact Bill Torbitt on Farnborough (0252) 516141.

## USA

Various locations throughout the USA, including: Boston, Baltimore, Chicago, Washington, New York and San Francisco

Programming skills required:

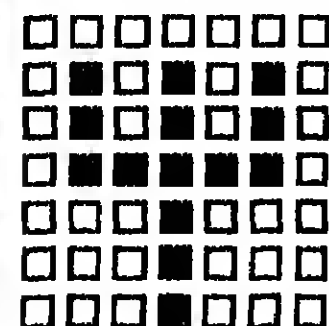
- ★ IBM COBOL CICS AND DL1
- ★ IBM COBOL IMS DB/DC
- ★ IBM COBOL WITH DL1
- ★ IBM COBOL IMS AND ADF
- ★ IBM PL1 WITH TSO/SPF
- ★ HONEYWELL DMIV GCOS COBOL

These contracts will be for six or twelve months (extendable) and the package will include:

- ★ VISA
- ★ GOOD RATES OF PAY
- ★ ACCOMMODATION OR ASSISTANCE
- ★ AUTOMOBILE FACILITY
- ★ MEDICAL INSURANCE
- ★ RETURN AIR FARE
- ★ TAX AND LEGAL ADVICE
- ★ SUPPORT FROM OUR U.S. OFFICE IN BOSTON

For further details contact Steve Whiting on Farnborough (0252) 516141

171101



# TRIDENT

TRIDENT HOUSE,  
38/44 VICTORIA ROAD, FARNBOROUGH,  
HANTS, GU14 7UD.  
Telex: B5B 233 Tel: Farnborough (0252) 516141

# COMPUTER SERVICES GROUP PLC

Licensed by the D.O.E. as Employment Agencies and Employment Businesses SC 747 and M1041

# Our Client...

In an everchanging market we are constantly seeking d.p. professionals at various levels to meet our clients' requirements. Below we have detailed a selection of our clients' needs, however should you be looking for an alternative career change, other than those mentioned, we are also in an excellent position to advise on your next move. For more information call us or return the FREEPOST coupon today.

## DIGITAL EQUIPMENT COMPANY LIMITED

London  
Epsom  
and Welwyn

Negotiable  
Salary  
& Car

To the Digital Equipment Company the need for the very best personnel cannot be stressed too highly. In the areas of Pre-Sales Analysis and Post-Sales service, that philosophy is most stringently adhered to, as these same individuals represent the Company at the most critical levels.

You will require technical expertise, as well as your undoubted interpersonal skills, to handle all of the problems you may have to face. Therefore, where necessary, full technical training will be provided if you have the potential we are looking for.

We are searching for a number of individuals with varying degrees of experience in the following areas:-

1. Pre-Sales Analysts

We seek career minded individuals to interface with our clients from the boardroom to the shop floor. We would be especially interested in Communications or Office Automation expertise.

Ref. 08D1

### 2. Post Sales Support

To deal with clients in a post sales environment at the very highest levels, co-ordinating a number of internal functions to supply our clients with the support service they need and expect.

Ref. 0802

### 3. Software Support

You will be working on solving specific client problems, installing software, configuring, sizing and acting as a software consultant. You will need some experience of RSTS/E or RSX11-M system Software. Full training in VMS will be supplied if required.

Ref. 0803

### 4. Field Service Engineers

Engineers are required throughout the region at all levels. We are prepared to retrain you on DEC kit where necessary.

Ref. 0804

We offer a number of benefits including a highly competitive salary, a company car, a thoroughly professional team that is committed to excellence, and all the support that the world's second largest computer manufacturer can provide.

To find out more please telephone or clip the freepost coupon, making sure you fill in the relevant reference number, and by return you will receive a client company profile and application form.

## SAUDI ARABIA

Our client, a leading distributor for the complete range of PRIME hardware/software is currently seeking the following professionals to join the team and maintain its position as a market leader in the Kingdom

**CAD/CAM SOFTWARE SPECIALIST**  
To £25,000 Tax Free

Based in Al Khobar you will provide support and consultancy services to our clients who use the MEDUSA system. A thorough knowledge of CAD/CAM with particular emphasis on the application of MEDUSA is essential combined with good communicating skills. Further CAD/CAM products are to be introduced in the near future.

### EDP SALES EXECUTIVES

**Salary + commission - potential earnings £30,000 + Tax Free**  
Operating from offices in Riyadh, Jeddah and Al Khobar successful candidates will be selling the whole range of PRIME products to the private and public sector.

Extensive experience of computer sales with an up to date knowledge of information technology is a prerequisite. Knowledge of Arabic an advantage but not essential.

Both the above positions are on a one to two year contract basis and offer free accommodation on married or single status, a car allowance plus other fringe benefits.

Contact us by sending a written application to:  
Chemsult Limited, 23 Pembroke Square, Notting Hill Gate,  
London W2 4DR. Tel: 01-243 0504.

# CHEMSULT

## IBM BUSINESS SYSTEMS CONSULTANTS AND TECHNICAL CONSULTANTS

Thames Valley £11,500-£14,500 + car

Our client, one of the world's leading UK based Financial Services Companies, wishes to recruit Consultants aged between 30-38 who have a strong Financial Accounting background, gained in Banking, Commercial or Industrial environments.

**SYSTEMS CONSULTANTS** should be of degree level with 5 years' minimum DP experience in a large IBM OS or DOS environment. (ICL experience would be useful).

Areas of expertise should be ACCOUNTS RECEIVABLE/PAYABLE or ORDER PROCESSING. Experience of the Package Industry would be a distinct advantage.

One of the positions requires a **PART-QUALIFIED ACCOUNTANT** with GENERAL LEDGER experience, currently working as a systems enabler or project leader. (Ref No. 7415)

**TECHNICAL CONSULTANTS** must have a minimum of 5 years in a Technical Programming capacity using MVS, DOS/VSE, CICS, COBOL and ASSEMBLER. Any knowledge of DL/1, IMS or IDMS would be an added advantage. (Ref No. 7414)

All successful candidates must have good communicative skills as responsibilities for each position will include giving presentations and customer training.

For more information and a chance to join a company that's a leader in its field of developing financial packages, contact SHIRLEY FRANCIS on the number below or 0838 751564, between 7-9pm quoting Ref No.

Lloyd Chapman  
Associates

123, New Bond Street, London W1Y 0HR 01-499 7761

## DATA ARCHITECTS SYSTEMS LIMITED

COBOL  
Programmers  
and Analyst  
Programmers

Negotiable  
Salary  
& Car

We seek a number of creative individuals, to work on development of interactive financial systems based on TANDEM hardware. Ideally you will have had in excess of twelve months' Tandem experience, however, those with a sound background in Interactive COBOL systems development will be given full training on Tandem machinery. The jobs are based in London. Salaries will be negotiated on an individual basis and a company car will normally be provided as part of the benefits package. To find out more about the company and these positions, please telephone the number below or clip the coupon quoting reference 0805 and by return you will receive an application form and client company profile.

We have a number of other clients in the Greater London Area whose requirements vary from those mentioned above. This is a shortlist of vacancies of which we are aware.

- IBM** Mainframe Senior Analyst Programmers and Analyst Programmers. Preferably with Database and TP experience, Cobol or PL1.
- IBM** GSD Analyst Programmers. To work either in a banking environment or the Oil Business.
- IBM** Systems Programmers. DOS/VSE, OS/MVS, MVS/SP or move up to XA.
- REAL TIME SOFTWARE DEVELOPMENT.** To develop system software in a communications or DBMS environment probably encompassing Office Automation UNIX, C, PASCAL, BCPL, etc.
- ICL** COBOL, IDMS, TP, TPMS. We have a number of opportunities throughout Southern England at various levels and salaries.

(7054)

## The Measure of Success

If you measure your success by the amount of recognition and satisfaction you get from doing a good job - READ ON.

Our Client, part of a highly diversified multi-national organisation, is involved in the exploration and development of the world's oil reserves. They are offering high rewards and enormous career potential to individuals with the interpersonal skills required for their intensive systems development program.

Initially based in Aberdeen, successful applicants will be

working as Analyst Programmers and Senior Analyst Programmers developing computerised systems to support clearly defined business problems.

Ideally you will have IBM GSD Systems experience, but, because you will be working within one of the fastest growing and most profitable organisations in the world, you must share the same motivation for success - if you do, the opportunities within the group will certainly measure up to your expectations.

If you feel that you have the qualities we are looking for and you want to work in an environment where good people get noticed, then please telephone the number below quoting Reference 0806 or alternatively complete the FREEPOST coupon. By return we will send you an application form and client company profile.

By return of post, please send an application form and client company profile to:

Name: .....

Address: .....

Home tel. no.: ..... (Used with discretion)

Business tel. no.: .....

I am interested in the following position(s) — 0801 ☐, 0802 ☐, 0803 ☐, 0804 ☐, 0805 ☐, 0806 ☐, other ☐. Please tick appropriate box.



# COMPUTASTAFF

FREEPOST, London SW1H 9BR. 01-222 6722 Telex: 894364.



# Project Management...

with Cornhill Insurance, a household name synonymous with sustained growth and unsurpassed customer service.

Based in historic Guildford, project management in Cornhill offers successful candidates the opportunity of controlling large scale system developments, utilising advanced IBM mainframe and distributed processing facilities, in a sophisticated database and telecommunications environment.

The prime requirement is for proven project management skills, through all stages of development, allied to a solid portfolio of d.p. experience, including substantial systems analysis exposure. Familiarity with the insurance industry, or an allied business sector would be particularly advantageous and the ability to liaise effectively with senior management is essential.

An attractive remuneration package, to £14,800, is offered comprising good base salary and subsidised mortgage. Additional benefits include free medical insurance and senior grades of staff qualify for a COMPANY CAR. Exceptional relocation expenses are provided as appropriate.

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Essentially, therefore, you will be an aggressive and tenacious sales professional, aged between 28-35, and with a proven success record. You will be a galvanising leader, able to hold your own in a variety of sales and management situations. Previous experience in communications or management is not essential provided you can demonstrate the above qualities.  
This position surely represents an outstanding career opportunity for the ambitious young sales professional.

For further information, contact Paul Child on (07535) 56155 or write to:  
Kramer Westfield Associates Ltd., 29 Victoria Street, Windsor, Berks. SL4 1HE.  
Recruitment Consultants in the Communications Industry.



**An Interest in the Environmental Sciences?**  
NERC is a Government-funded body responsible for research in the Environmental Sciences. We have opportunities for:  
**Applications Programmers**  
to join a team in Swindon undertaking software development and support for the constituent Scientific Institutes of NERC. This work covers such areas as data management, graphics and general scientific programming, predominantly in FORTRAN.  
Qualifications and Experience: Candidates should normally have a degree (or equivalent) in a scientific or engineering discipline. At least two years' post-graduate experience is required for the HSO grade.  
Experience of statistics, numerical methods, or database techniques would be an advantage.  
Salary and Conditions: Scientific Officer £5,682-£7,765 pa. Higher Scientific Officer £7,145-£9,561 pa.  
Starting salaries may be above the minimum of the scale, according to age and experience. Benefits include a non-contributory pension scheme.  
Further information regarding the work could be obtained from Mr G. H. Darvall, on Swindon (0753) 40101 Ext. 378.  
Applications forms and further details are available from Mr C. I. Brohier, NERC Scientific Services, Holbrook House, Station Road, Swindon, Wiltshire SN1 1DE. Tel: (0753) 40101 Ext. 523.  
Closing date for applications 18 January, 1984.  
Please quote ref: M/P 67 and 68.  
**NATURAL ENVIRONMENT RESEARCH COUNCIL**  
(7238)

**Major Accounts Executive**  
**OTE £25K + CAR**  
**Area Salesman**  
**OTE £22K + CAR**

KGB Micros have achieved dynamic growth in the sale of microcomputers and associated software. Their product range includes the IBM PC, ACT Sirius, Apricot and Wang equipment. To keep pace with increased demand they currently seek high calibre salespeople. Both positions require self starters who will be capable of managing current business and also developing new accounts, both from substantial incoming leads and by identifying new prospects.

The position of Major Accounts Executive would suit someone ready to move into a senior sales role, with at least 8 years experience of selling either computers, word processing equipment, software or bureau services.

The Area Salesman needs around 2 years experience as specified above. As part of maintaining and developing business, this person will also attend seminars and exhibitions.

We can offer excellent remuneration with no ceiling on commission earnings plus the opportunity to sell acknowledged, market leading equipment.

LOCATION: Berks.  
Please contact Dori Tsoulias for further information.



**D.P. Recruitment**  
SERVICES LIMITED  
FREEPOST LONDON W52BH TEL: 01-637 5501 (24 hour telephone)



# Don't miss the boat

## Leap into 1984

It's now 1984 which means new budgets and new opportunities for the New Year. It's now you should be taking stock of your position, your agency and your next contract. For those who are not owners of Computastaff as one of the largest and the most successful agencies or for those of you who may not have yet joined the world of contracting, it may help you to assess us and what we have to offer — now.

Let us first define the word *successful*. Could it be it's because we have 15 professional sales consultants backed by a team of support staff, who are continuously in contact with the market and its requirements? Could it be that in identifying and negotiating projects for our growing team of more than 200 contractors and in recognising their skills, we have built a well earned reputation based on financial stability, professionalism and commitment? Or could it be because we cover the areas often forgotten by other agencies? In understanding and looking after your interests for instance, we have a highly beneficial sick pay scheme, prompt weekly payment for those who require it, and for those who are taking the plunge for the first time, we offer in depth knowledge and experience in helping you arrange pensions, mortgages, insurance and other financial matters.

Which ever way you look at successful contracting we believe we have it covered. So what is in it for you?

### RATES:

You will be paid the most competitive rates — probably the best in the market today.

### CONTINUITY AND SECURITY:

Many of our contracts are long term, i.e. 12 months or more and most are extended. Additionally, your profile will be on our fully computerised database, so 6 weeks before your current project is completed, we will already be discussing future options with you for your next assignment.

### FREEDOM:

There is no element of new found independence working on development projects in blue chip multi-national organisations, both locally in the UK and overseas.

### CHOICE:

Our need for professionals covers the complete spectrum of data processing in areas such as finance, commerce, industry and military to name but a few. To cover these requirements, we constantly need experienced (2 years +) and skilled Programmers, Analysts, Technical Authors, Systems Programmers, Consultants and Specialists for interesting and unusual applications. Space restrictions do not allow us to list all our requirements but in a typical week we are asked to fill between 100-200 contract positions of varying skills — it means we must have the one that is suitable for you.

Whatever your background, experience and skills it is more than likely we will have the next contract for you.

Act now and don't miss the boat — there's never been an easier and better time to join the winning team.

Either ring our Contract Resource Department on 01-222 6722 quoting Ref. C004, or alternatively complete and return the FREEPOST coupon (no stamp required) in our advertisement on the opposite page and leave the rest to us.

### THE PERMANENT ALTERNATIVE

If you are not yet aware of taking the leap into the world of contracting call Derek Miers on 01-222 6722 to discuss permanent opportunities or alternatively return our coupon on the opposite page.



**COMPUTASTAFF**  
Livingstone House, Carteret Street, London, SW1H 9DJ 01-222 6722

**Logitix** Logitix Recruitment Limited  
10 Grenville Place, London SW7 4RW

Telephone 01-373 3063

### Real-Time Analysts & Progs

Hants/Berks: Salaries to £12K

Real-time Analysts and Programmers, with at least two years post graduate industrial experience, are urgently sought by a leading software consultancy. The broad range of projects they undertake, ranging from advanced defence systems through to office automation products, guarantee a varied and stimulating working environment. Your skills should include substantial real-time programming in a block-structured language and an Assembler, combined with a knowledge of the utilities offered by operating systems such as RSX, VMS or UNIX. For those applicants with management experience, or potential, rapid promotion is highly likely.  
Ref: L468A

### Graphics Software

London & Home Counties: Salaries to £11K

A number of our clients are involved in the development of increasingly user-friendly interfaces to front-end processors. They are, therefore, looking for Analysts and Programmers with experience of generating tabular and graphical, device independent, displays. Particular hardware and software skills required include: fluency in one or more of PASCAL, C, FORTRAN and MACRO-11 supplemented by knowledge of PDP-11 or M-68000 based systems. Applicants who have developed such systems utilising UNIX will be especially welcome.  
Ref: L468B

### 'C' & UNIX Programmers

London: Salaries to £10K

A highly respected Product Supplier is currently seeking to recruit several Systems and Applications Programmers to work on its UNIX-based range of products. Applicants, aged 22-25 years, should have graduated since 1981 with a good class honours degree in a numerical subject and have at least one year's commercial or industrial experience. Very recent M.Sc. or Ph.D. candidates are also encouraged to apply particularly if their chosen subject matter was directly concerned with UNIX systems software. It is advantageous to be fluent in "C" programming language and also offer PASCAL as a secondary language.  
Ref: L468C

### Technical Authors

Italy: £11K+ Overseas Allowance

An internationally renowned Systems and Software House is currently seeking additional Technical Authors for permanent career positions in Italy. Suitable applicants should have a good educational background and at least 18 months' experience in the design and writing of User documentation for either a software or hardware product. A good command of the English language is essential as is the ability to communicate with both technical and non-technical personnel. Applicants who have participated in the production of a manual for end-users of an Office Automation System will be of particular interest to our client and will attract a salary premium. Knowledge of Italian would be an advantage but it is not a prerequisite for these positions.  
Ref: L468D

### Prolog and Lisp Programmers

London & Home Counties: Salaries to £13K

We have a large number of clients with requirements for Prolog and Lisp Programmers to assist in the development of expert system software packages. At least one degree in a numerical subject or Psychology is essential preferably supplemented by Postgraduate exposure to a real-time environment. Candidates with experience in the following areas will be of particular interest: object-based systems, man-machine interfaces, rule generation, operator aids and logic set theory. Naturally, all our clients offer the most advanced development facilities and, where necessary, will assist with relocation expenses.  
Ref: L468E

### Software Q.A.

London and Thames Valley: Salaries to £14K

A market leader in the areas of office automation and information science technology requires additional Software Quality Assurance Engineers. All respondents, aged 25-35 years, should hold at least one numeric degree and have at least two years' commercial experience with a real-time systems design environment. Candidates are expected to be fully au fait with international programming and systems design criteria. Your actual work content will include the investigation of scheduling and product review methods; the evaluation of in-house software requirements and systems specifications and lively participation in the production of new and updated technical documentation. For certain positions, candidates should have previous and man-management experience gained in an environment where product delivery and software releases are subject to strict deadlines.  
Ref: L468F

### Coral 66 Programmers

S. Home Counties: Salaries to £11K

Applications Programmers and Designers are currently required by the software development division of a leading Systems Supplier. Suitable applicants should offer a minimum of 18 months' CORAL 66 programming experience in a real-time mini-computer or microprocessor environment. Particular hardware experience is not important, but familiarity with PDP-11, VAX Ferranti Argus or the GEC-4000 series would be a distinct advantage. Our client offers an excellent training programme and there will be every opportunity for successful applicants to learn new skills and progress into either a Management or Consultancy role.  
Ref: L468G

### Comms Designers

London and H. Counties: Salaries to £18K

A long established Systems House and Consultancy, renowned in the field of Communications Designers, is currently seeking additional Systems Designers. Suitable applicants should be aged 25-35 years and educated to at least B.Sc. standard. You will be expected to have a thorough knowledge of at least two of the following: Communications protocols (VSE, SDLC/ADLC) and ISO standards; Office automation systems and networking techniques; systems design and consultancy; familiarity with Unix or VAX/VMS look-alike products. Applicants who have additional knowledge of VAX/VMS will be of particular interest to our client. These positions represent excellent opportunities to enhance your skills since our client is undertaking development work utilising the most advanced techniques available.  
Ref: L468H

### Pentagram URGENT CONTRACTS

Programmers: Starting dates from January

IBM	IMS DB/DC (ADF)	Surrey
IBM	8100 DTMS	City
ICL	VME	Herts
ICL	Systems 25 1AS	City, Berks
VAX	VMS-COBOL	Herts

### PERMANENT

Business Analysts London, Herts £14,500  
Programmer Analyst IBM CICS City £15,000

Ring:

Mrs. A. Atkinson, Royston (0763 47161) 24 hours



PARIS - FRANCE

### Two system analysts

Who should be in possession of:

- a good knowledge in french, • a university degree, • 3 years experience minimum, • a perfect knowledge of IBM assembler, • experience of application with IBM pars system.

We offer:

- a stimulating work environment within a dynamic and highly motivated group, • excellent prospects for promotion

- a remuneration package designed to attract high level candidates, • location of work in Paris.

Please send C.V. to Mme Pereira, 5 Villa Brune 75014 Paris (France).

### THE WAY UP!

Program in COBOL or PL1

£10K + Bonus and broaden your skills by TRAINING ON COMPANYS IBM SYSTEM 38. Systems include Sales/Marketing/Commercial.

### ANALYST/PROG

Thames Valley £10K-£12K + Benefits to develop a career in professional and busy COBOL/CICS/OLI department of European company with wide-ranging electronics interests.

For further discussion, call me, George Burrows, on 01-548 8441 (24 hours) NOW!

cb executive (kingston) ltd

Specialists in Commercial Computing

### FLY HIGH!

IN REAL TIME S/W

£9-£17K  
This is your chance to help develop a new, integrated cockpit system — then make it work in FLIGHT TRIALS on one of the company aircraft! Expand your experience using 18-bit micro, VAX, LANs and PASCAL — with a leading name in innovation. If you are well qualified and have good REAL TIME SOFTWARE experience then get your career airborne TODAY.

Call me, Vincent Melling, NOW on 01-548 8441 (24 hrs) — for further details. (7077)

cb executive (kingston) ltd

Specialists in Real-Time

### MUMPS PROGRAMMER

TO WORK IN SWITZERLAND

Salary commensurate with experience. Accounting, medical application experience useful but not essential.

Contract 3-6 months initially. Immediate start.

Contact:

Mr. Eduardo Ribeiro  
HealthEcon Limited  
P.O. Box 1510  
4001 Basel, Switzerland  
Tel: (01041 61) 23 53 76  
8 a.m.-4 p.m.

(6821)

### AREGON

Aregon International, the world's leading videotex company, requires an

### International Support Manager

For its fast-growing overseas activities. Based in London, the position will offer an attractive salary package commensurate with the seniority of the position.

Applicants with a good working knowledge of the international videotex market are asked to write in confidence, enclosing full cv's to Miss Jannine Cunningham, Aregon International Limited, 17 Lincoln's Inn Fields, London WC2A 3EG.

(7084)

# CONTRACTS 1984

## IBM

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Scotland

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Surrey

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Midlands

Berks

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# Communications Specialists

## Analysts to Senior Consultants

Holland  
015-025K

An expanding member of an international professional group of companies, specialising in a wide range of communications systems in the Petrochemical, Industrial and Defence Sectors seek additional professionals for permanent positions within their company.

Based in Holland within easy access of all the major cities. Successful candidates will be required to take full responsibility for all stages of development through to implementation.

We are looking for Comms. people to concentrate on establishing new communications software and will more than likely have worked with some of the following:

- ★ Real Time Software ★ Defence Projects ★ Air Traffic Control ★ Networks
- ★ Petrochemical Projects ★ Process Control ★ DEC ★ RSX ★ MICROS ★ Assembler

In addition to the above technical skills senior candidates should also have experience or exposure to the following:

- ★ Project Management ★ Client Liaison ★ Marketing Support ★ Project Definition

Successful candidates may look forward to enhancing their career prospects and gaining valuable experience in an international environment. Benefits include a competitive salary, annual bonus, relocation expenses and a car with senior appointments.

Interviews will take place in London or the Continent in the coming weeks. For immediate consideration, please send a copy of your c.v. or telephone for further details and/or an application form.  
Ref. CW45

**DATAMATICS**  
RECRUITMENT SERVICES  
01-399 9183  
Datamatics, Freepost, Surbiton, Surrey KT6 5BR

**VAUXHALL MOTORS LIMITED**  
**PROGRAMMERS**  
**PROGRAMMER/ANALYSTS**  
**LUTON, BEDFORDSHIRE** **SALARY UP TO £10,500**

We require people with a minimum two years' experience of COBOL, TSO, SPF and JCL on IBM mainframes. Knowledge of IMS and CICS would be advantageous.

Successful applicants will join Development and Maintenance Project Groups working on online and batch systems covering a wide range of business activities in the Motor Industry.

You will join us at the main Data Centre for General Motors in the UK, operating on NAS 8060 and IBM 3033 mainframes located at Luton, Bedfordshire.

You can take advantage of the training schedules designed by our full time systems education group that are tailored to individual needs to ensure that you can meet the available promotion opportunities.

The successful applicants will be offered the conditions of employment expected of a major international corporation, including a modern pension scheme, fringe benefits and an appropriate relocation expenses.

All interested applicants are invited to write giving full details of experience and qualifications to:

The Employment Manager  
Vauxhall Motors Limited  
PO Box No. 3  
LUTON, Beds LU2 0SY

**Lambart**  
**COMPUTER ENGINEERS**  
**REQUIRED**

For field service and in-house on DEC PDP11, VAX and compatible options

Salary based on experience

Apply:  
Mr S. Crisp  
Lambart Computing Limited  
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Gourne End, Bucks  
Tel. (06285) 27075

**URGENT - ICL CONTRACTORS**

Contracts available now on: ICL 2800, Syst 25, ME29, DRS (Especially with VME, VME/B, DME/OMAC, IOMIS, TPMS, SCL, ASSEMBLER).

Also 1 year contracts KUWAH: COOOL Programmers - Start February.

Contact Jackie Linkson, Marlin Computer Services Ltd  
5 St Andrews Street, Hatfield, Herts. Tel. 0932 57731

**Real Time Communications**

S-COM is an expanding software and systems house specialising in true Real-Time applications. Our client list is extensive and includes many major international companies.

A number of vacancies have arisen for both Freelance and Permanent staff including a project for one of our major clients, based on the South Coast, to design and develop a new communications product. Suitable applicants should possess a degree or similar qualifications. A good knowledge of Assembler and at least one high level block structured language together with relevant experience in any of the following communications environments:-

- Telephony, Message Switching
- Operating Systems, Telex
- Packet Switching
- General Automation Minis

Where a project is remote from Aylesbury, subsistence payments are often payable in addition to salary or fees.

	Permanent	Freelance
Senior Software Designers 7-8 years relevant experience	To £16K p.a.	£525 p.w.
Senior Programmers/Designers 4-5 years relevant experience	To £11.5K p.a.	£470 p.w.

For further details contact Lawrence Mills or write enclosing a full CV.

**S-COM** Computer Systems Engineers Limited  
Tower House, High Street, Aylesbury, Bucks. Tel. 0296 32023  
Evenings after 7pm or weekends: 0296 33059

**FBC**

FBC Limited is an international engineering company with a strong research base and certain industrial chemical interests. It has a leading position in the British market, affords companies in 14 other countries and an annual turnover of some £150 million.

## System Development Opportunities

based near Cambridge

### Senior Analyst/Programmer

Reporting to the Data Centre Manager you will be responsible for the implementation and use of software on the VAX and for the forward development of a number of key services utilising modified and standard software packages. You will also provide advice and guidance to staff to ensure the efficient use and development of software.

You will be of graduate calibre with technical training and three years' experience of operating systems and systems software, preferably VAX. Effective communication with all levels of staff and the ability to plan a heavy technical workload are essential.

### Data Centre Manager

You will be responsible for setting up the new Data Centre, installing hardware, setting up the software environment, implementing new application systems which are based on tried and tested packages and providing live services seven days a week, twenty four hours a day. You will be assisted in these tasks by a team of project managers and consultants. You will be a graduate or equivalent, with at least five years' systems experience to include computer operations management, project management, and, preferably some consultancy. The ability to motivate staff and take decisions is essential as is the ability to work under pressure to achieve deadlines and budgets.

### Operations Supervisor

You will report to the Data Centre Manager and have full responsibility for the day to day running of all computer operations. You will also be heavily involved in setting up on-line and batch facilities for Production and Head Office staff.

You will have three years' computer operations experience, preferably with some VAX working. The ability to plan, communicate and run a secure, clean and efficient installation, and necessary pre-requisites.

### Analyst/Programmer

You will assist the Senior Analyst/Programmer with the implementation and use of software on the VAX 11/780. You will also specify, design, and carry out modifications to software packages as well as being involved in some development work.

You will be of graduate calibre with at least two years' computing experience with a technical or commercial background preferably in a science based industry.

For all these positions we offer a competitive salary supported by a substantial range of benefits, including assistance with relocation expenses where appropriate.

For an application form please phone Cambridge (0223) 870024 (24 hour answering service) or write with full curriculum vitae and salary details to Mr. A. G. Britton, Personnel Office, FBC Limited, Hauxton, Cambridge CB2 5HU.

## Senior Programmers & Programmers

West of London  
Salary Negotiable + Car

Iris Computer Systems Ltd., a rapidly expanding company, has vacancies for both **PERMANENT AND CONTRACT STAFF**, for an interesting mix of projects in the UK and internationally. Foreign project staff would be based in the Heathrow area of the UK with regular visits to our customers abroad.

Opportunities exist for computer professionals with ON-LINE or DATABASE experience on minis or mainframes. COBOL experience with good communication skills and the ability to plan and execute high quality work is essential. Knowledge of PERKIN ELMER RELIANCE would be advantageous.

Our staff enjoy an excellent benefits package and good promotional prospects for the right persons, male or female. Included in the benefits package are:

- COMPANY CAR
- FREE LIFE INSURANCE
- PERSONALISED PENSION PLAN
- PRIVATE MEDICAL SCHEME

If you want a job with variety, UK and International travel, in a company that gets a job done professionally, then ring Bernard Evans on 01-897 0997 for an informal and confidential discussion, or write to him, enclosing a detailed c.v. at the address below.

**IRIS**

Computer Systems Ltd.  
53 Hargrave Road, Maidenhead,  
Berkshire SL6 6JR, United Kingdom.





# CONTRACTS

## IBM

3083 SAS AND/OR PL/I ANALYST/PROGRAMMER  
UNIPAY & UNIPERSONNEL ANALYST  
4331 OS/VS1, CICS, ROSCOE SYSTEMS PROGRAMMER  
4341 'INQUIRE' COBOL ANALYST/PROGRAMMER  
SYSTEM 38 RPG III PROGRAMMER (BANKING EXPERIENCE)  
SYSTEM 38 RPG III PROGRAMMER (FEBRUARY START)  
SYSTEM 38 RPG III ANALYST/PROGRAMMER (FEBRUARY START)  
MVS SYSTEMS PROGRAMMER  
OOS/VSE SYSTEMS PROGRAMMER  
IBM 4341 TO WANG VS100 CONVERSION ANALYST/PROGRAMMER

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KENT  
KENT  
SURREY  
SURREY  
SOUTH LONDON

## ICL

ME29, 2903 TME COBOL ANALYST/PROGRAMMER  
VME 2900 TOTAL, SCL TPS PROGRAMMER  
VME 2900 TECHNICAL SUPPORT  
VME 2900 IOMS, TPMS COBOL PROGRAMMERS  
VME 2900 IOMS, COBOL PROGRAMMERS  
VME 2900 TPMS & IOMS COBOL PROGRAMMERS & ANAL/PROGS.

CITY  
SURREY  
SOUTH LONDON  
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SOUTH COAST  
ALL AREAS

## OTHERS

"PAPERLESS OFFICE" ANALYST/PROGRAMMER  
TANDEM ANALYST (BANKING EXPERIENCE)  
TANDEM COBOL PROGRAMMERS  
JSP COBOL (GAIN TANDEM TRAINING)  
ELECTRONIC OFFICE SYSTEMS ANALYST/PROGRAMMERS  
REDFON EDITOR PROGRAMMER WITH VIEWDATA  
UNIVAC 1100 COBOL PROGRAMMER (BANKING EXPERIENCE)  
INTEL MDS ASSEMBLER PROGRAMMER  
PDP RSX11M CORAL 66 & MACRO 11 PROGRAMMER/ANALYST  
VAX, VME SOFTWARE PROGRAMMERS WITH PASCAL & 'C'  
DATA GENERAL BUSINESS BASIC PROGRAMMERS  
DATA GENERAL, AOS, INFO COBOL PROGRAMMERS  
DATA GENERAL, CS COBOL PROGRAMMERS  
HP 3000 RAPID PROGRAMMER  
HP 3000 COBOL PROG. (18 MONTHS TOTAL PROGRAMMING EXP.)  
PRIME 'PICK' PROGRAMMER

MIOOX  
LONDON  
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LONDON  
MIOOX  
ESSEX  
ESSEX  
WEST SUSSEX  
SUSSEX  
BERKS  
WEST LONDON  
N.W. LONDON, HANTS  
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LONDON  
LONDON  
SURREY

For details of these and other on-going requirements please contact Lorraine, Wendy or Tony at KPG, or contact Lorraine on Walton-on-Thames 245552 (evenings and weekends).

## ENGINEERING

RF DESIGN ENGINEER  
DIGITAL DESIGN ENGINEER  
ELECTRONIC COMMS. ENGINEER  
ANALOGUE ENGINEER  
TEST EQUIPMENT ENGINEER  
PROCESS CONTROL ENGINEER  
SOFTWARE ENGINEER  
COMMISSIONING ANALOGUE ENGINEER

Contact Lynna at KPG or on 01-543 4140 (evenings and weekends).

**KPG**  
01-948 5922

KPG Computer Support Services Limited  
Cobden House, Park Lane, Richmond, Surrey, TW9 2RA



## NEW ZEALAND SYSTEMS ANALYSTS OR SENIOR SYSTEMS ANALYSTS DEVELOPMENT METHODOLOGIES DATABANK A WORLD LEADER

Databank Systems Ltd. is unique in its central role handling the EDP needs of all the New Zealand banking banks as well as operating a substantial commercial bureau operation.

We have developed and operate a nationwide distributed network which links 17 computer centres as hundreds of bank branches. The hardware includes 20 mainframes (ranging from IBM 3083's to IBM 4341 (Group 2) machines) together with numerous microcomputers and micro processors. Development activities are concentrated in our head office in Wellington (New Zealand's capital city). Current major developments include the re-development of the banking system using the information engineering methodology.

The department for which we are recruiting has an important role of supporting the use of information engineering by the applications development team. This support is provided through the provision of internal consultants as well as evaluating current practices, tools and aids, and introducing improvements.

Our vacancies will interest those who are already senior systems analysts or equivalents, and who have a good knowledge of information engineering, analysis or a related structured analysis technique. They will be able to demonstrate a professional approach to technical problems and from time to time as well as an ability to think logically and to communicate well.

If you are definitely interested in a career with one of the world's leaders in EDP please air mail a resume to:

Manager  
Staff Services  
Databank Systems Limited  
PO Box 3647  
Wellington  
NEW ZEALAND

Two of our senior managers will be in the UK early 1984 to personally discuss what Databank and New Zealand can offer.

## COMPUTER ENGINEERS

Outstanding opportunities to join progressive companies expanding rapidly in the U.K. and European countries.

Field Engineers - Basic, to £10K + O/T & D.Y. Car etc. Experience of recognised times (RHS) Ltd. and associated companies. London, Home Counties, etc.

Work Shop - Supervisor £10K - Engineers £8K. Fault find and repair to district level in support expanding "hangar" field team. Recognised hardware. London and Home Counties.

Whatever your objective, expand your career. NOW. Ring Mike Wright on 044 8441 (office) or 01-384 2359 (outside office hours and weekends).

**db executive (kingston) ltd**  
Specialists in Customer Engineers

## ANALYST/SENIOR PROGRAMMER

An immediate requirement for the above post to take overall control of a small software team. Experience in Unix and C. Salary circa 12K.

Apply Chippenham Computers Ltd, Systems House, Bumpers Way, Chippenham, Wilts. Tel: 651341.

## DENTAL ESTIMATES BOARD, EASTBOURNE

### CHIEF SYSTEMS DESIGNER (SYSTEMS MANAGER)

SALARY SCALE: £10,393 TO £12,815  
+ ADP ALLOWANCE OF UP TO £564 P.A.

The Dental Estimates Board for England and Wales require a Chief Systems Designer (Systems Manager).

Applicants should have had experience at management level within a computing department responsible for the maintenance and development of a wide range of applications. Experience of mainframe ICL equipment would be desirable but is not essential.

Health Service conditions of service and superannuation arrangements apply to this appointment.

Further details and a form of application may be obtained from the Clerk to the Board, Dental Estimates Board, Eastbourne, East Sussex BN20 8AD (0323 25552). Closing date for the receipt of completed applications: January 31, 1984.

A unique opportunity for

## CAD/CAM PROFESSIONALS SOFTWARE AND HARDWARE to £16,000

Our client, a world leader in the design, development and supply of computer aided design and manufacturing systems, is totally committed to expansion with an exciting and dynamic long term development programme. As a result they now seek specialists with the expertise and innovative spark to maintain the standard of technical excellence which is necessary in this highly demanding field. With a number of vacancies to senior level we wish to hear from you if you have a degree or equivalent in Science, Engineering or Computing and are currently involved in one of the following:

- SYSTEMS ENGINEERING • SOFTWARE DESIGN • APPLICATION PROGRAMMING
- HARDWARE DESIGN & DEVELOPMENT • MICROPROCESSORS

Specific areas of expertise which would be of particular interest include:

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Based in the South of England the company offers secure employment, exciting prospects and a first class salary and relocation package. This is a unique opportunity in both career advancement and lifestyle.

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Recruitment

## IBM System/34/36/38

## GROUND FLOOR OPPORTUNITY

Nr. Staines, Middx.

£8-15K

Our client is a major supplier of application software to users of the IBM System/34, System/36, and System/38 range of equipment. In addition to the U.K., its products are in use in the U.S.A., Europe, Far East and the Middle East. The company has three offices in the U.K.; in Central London, the West Country, and the Midlands and is expanding rapidly. Due to this growth, they are in the process of relocating their Central London office to larger offices near Staines, Middlesex. This has created a number of career opportunities for high calibre people:

### Project Leaders

Applicants must be able to demonstrate a high degree of technical competence (preferably on IBM System/34, /36, /38 computers), a sound understanding of business, and the ability to work with system users in developing and implementing large scale projects. You will be expected to accept total responsibility for projects to which you are assigned, including control of the project teams.

### Analyst/Programmers

Applicants should possess sound programming skills preferably in RPGII and/or RPGIII. (Other languages will be considered if applicants demonstrate the ability to learn quickly). Systems experience in a business environment is preferred. These positions offer work on both package implementation and bespoke systems, together with a career path into senior responsibilities.

The company, whilst at the fore-front of its market, is still small enough to allow its staff to play an active role in its growth and success and therefore, career prospects are excellent.

For further information, please telephone Andrew Cousins at the Reading office, or write enclosing full c.v. Interviews will be held in Central London or Reading.

**MCL**

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PA Technology is increasingly recognised as one of the world's leading organisations in the creative application of high technology. Each Laboratory - whether in Europe, the United States or South-East Asia - combines marketing and business expertise with technological skills of great breadth and depth, and is involved in innovative and leading-edge product and systems development for many of the world's largest and most respected organisations.

Electronics engineering is a vital part of much of PA Technology's work and growth has created an opportunity - at management level - within the Cambridge Laboratory. Candidates, probably in

their early/mid-30s, will be graduates with a high-quality multidisciplinary development management background in hardware, software or systems. Equally important is the ability to manage creative development teams, and interface with and relate to business as well as technological needs of clients. Remuneration could be up to the £25,000 level; the location is PA Technology's UK laboratories at Melbourn near Cambridge, to which relocation assistance will be provided if necessary.

Please send a full cv, or telephone or write for an application form, to Ivor Harland, Ref: MV789464/CW.

**PA**

**PA Personnel Services**

Hyde Park House, 60a Knightsbridge, London SW1X 7LE.  
Tel: 01-235 6060 Telex: 27874

(7058)

## SMR Sales & Marketing Recruiters Ltd

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### SALES EXECUTIVES ANY ADVANCE ON 100,000

That's the number of units we have already installed in the U.K. and Europe. What we need now are more top class sales people to build on our dramatic success. Our system is universally acknowledged as a masterpiece of multi-function computing with the emphasis on graphics and communications. Our computers have so much that comparable systems don't have; qualities that are implicit in their consistent high reliability and the inherent scope for alteration, adaptation and expansion. What we need now are the right sales people to exploit our considerable market opportunities.

Additional vacancies currently exist in

### LONDON & THE SOUTH EAST MIDLANDS & THE NORTH WEST

for sales people who already have a proven record of success in selling computer equipment into mainframe installations. IBM experience will be particularly useful. In return we offer a very attractive compensation package, including company car, company pension, etc., with a high basic salary and real possibilities of high earnings.

### IN EXCESS OF £30,000

We will also provide 3 weeks training shortly after joining, at our overseas training centre. Contact us now and join in time for our new launch in the Mediterranean. For Midlands and the North West, contact Roger Dodd (Lichfield) and for London and the South East, contact Alasdair Scott (London), quoting reference DSB/123.

#### LONDON & SOUTH

29 Oxford Street,  
London W1. (01) 734 9776

#### MIDLANDS & NORTH

Cathedral House, Beacon Street,  
Lichfield, Staffs. (05432) 56612

Answering Service after 6 pm and weekends  
SALES TRAINING, MARKET RESEARCH, RECRUITMENT

(7014)

## OPPORTUNITY IN DATA COMMUNICATIONS for experienced data communication engineers commercial interest in becoming our U.K. SALES ENGINEER SALES MANAGER

The product we are going to sell is a new general protocol converter and associated equipment, manufactured in Holland.

More than one thousand units were ordered in first year of sales in Holland and Germany.

The man we are looking for must be familiar in detail with asynchronous and synchronous protocols such as IBM BSC/SDLC, Burroughs poll/select, and must be able to quickly familiarise himself with all aspects of (RS232 based) data communications procedures.

His commercial interest and management capabilities should enable him to simultaneously build up a full responsibility for our U.K. operations, and end ambition are absolutely essential.

Having representative housing in the vicinity of London with a spare office room and telephone for operations would be an asset.

Our proposal:

- A fixed salary plus percentage of the U.K. result
- Company car and expenses
- Reasonable refund for office space and telephone (if available)
- Two to three months' training in Holland (on a trial period)

If you are interested, write and supply us with the following details:

- Education, experience, references, photo and personal data
- Location of your house and description of office (if applicable)
- Requested salary and emoluments

**INCA** Amersfoortseweg 15, P.O.B. 211  
7300 AE APELDOORN, Holland

## TECHNICAL SUPPORT MANAGER

Longman Group is a leading British publisher and is active in publishing software packages for school, home and professional use. Longman is looking to strengthen its creative team for home learning software by the addition of a Technical Support Manager.

The requirement is for a good working knowledge of 6502 Assembly language (a working knowledge of 8080 is desirable but not essential). Previous experience of working on computer software in publishing or education will be a considerable advantage. The person selected will work as part of a team both designing and commissioning educational software for learning purposes and will require a creative and entrepreneurial outlook.

Please write enclosing a full curriculum vitae together with salary expectations to:-

Mrs. Sally Ingle, Personnel Manager, Longman Group,  
Longman House, Burnt Mill, Harlow, Essex CM20 2JE

**Longman**

(7100)

## DATA PROCESSING MANAGER LONDON

Samuelson Group PLC, suppliers of equipment and services to the Film and Television Industries, require a Data Processing Manager for an established ICL 2804 installation. The position will carry day to day responsibility for the installation and for the future direction of its systems capability.

The successful candidate must be able to demonstrate good technical skills in all aspects of ICL 2804, RPO2 programming, systems and development experience is essential.

Applications including details of experience and current salary should be made to:

Mr R. Greaves,  
Samuelson Group PLC,  
303-315 Cricklewood Broadway,  
London, NW2 6PD.

**CVS**

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### PERKIN-ELMER

SERVICE and SUPPORT in SLOUGH  
Circa £10000 + Car

Perkin-Elmer - the 32 bit mini-computer manufacturer - has its European Software Development Group in Slough. Thirteen computers are used to develop systems and applications software. The Engineering Department now require an additional Service Engineer to work in-house and:

- \* ensure optimum efficiency and reliability of computer hardware and peripherals
- \* liaise with users and operational staff
- \* reconfigure the systems
- \* install new equipment

If you have at least eighteen months experience installing or servicing Perkin Elmer machines, call or write to Myriad in Reading for more information about this exciting opportunity.

Computing & Electronics  
**myriad**  
Recruitment Consultants

30 Fleet Street, London EC4Y 1AA

Telephone: 01-353 0981 24 hours

25 South Street, Reading, Berkshire RG1 4QU

Telephone: Reading (0734) 591151 24 hours

(7042)

## REAL TIME SPECIALISTS Industrial - Scientific - Defence - Technical £8K - £25K

The Good News Is

The ever increasing uses to which the computer can be applied, never ceases to amaze. We have clients in London, Home Counties and indeed nationwide who are active in so many exciting yet diverse fields of computing it makes specialist knowledge essential and highly sought after.

The Bad News Is

We haven't nearly enough good people to satisfy the needs of those clients who are urgently seeking: Programmers/Analysts, Software Engineers/Designers, Project Leaders/Managers, Consultants, and Electronics Engineers. We don't have room to mention all the areas of applications but some of them are as follows:

Communications - Data/Tele - Voice Recognition - Message/Packet Switching - LANs - Protocols, Industrial Process Control - Data Acquisition - Instrumentation - Plant Monitoring, M.O.D. Systems - Radar - Navigation Systems - Command & Control - C3 and C3I systems - Electronic Warfare - Man Machine Interfaces, Office Automation, Information Technology, E.P.O.S. systems, Software Tools, Operating Systems, Artificial Intelligence Systems, Expert Systems, Robotics, CAD/CAM Systems, Graphics, Image/Signal Processing. You need in-depth specialist experience of such systems as: DEC PDP-11, VAX, Tandem, Argus, Hewlett Packard, Intel, Motorola etc., with relevant operating systems, UNIX would be most desirable; and have used languages such as: PASCAL, FORTRAN, CORAL, MASCOT, ADA and ASSEMBLER. You need upwards of 2 years experience - got that, then your next move is to pick up the telephone, dial 01-836 9719, any hour of the 24 (week-ends too) and ask for Beryl McLaren, you'll get a personal reply not a recorded message.

01-836 9719

Specialist recruitment of  
Industrial, Scientific, Defence  
and Technical personnel

**Jupiter**

Computer Appointments

12-13 Henrietta Street, London WC2

(7037)

## Computer Professionals

### Communications/Electronic Warfare

Berks and Herts £11-£17K

Electronics and/or programming skills with, for some candidates, project leading experience, are needed for both civil and military systems work. Multi micro configurations are used for one system which involves Data Communications. Design of distributed databases and Coral programming background would also be relevant. Degree level candidates should be capable of technical innovation. Ref 0501/L

### Database Consultants

Central London £15-£20K

Two challenging posts in a consultancy are available for candidates who can demonstrate their ability to act as technical consultants to design projects. At least five years database specialisation spread over more than one host computer system is needed. Dynamic personality with good client skills is also a required attribute. Ref 0501/M

### Banking Systems

London/Herts Border c£17K

This systems house specialises in transaction processing technology and has designed and installed a number of sophisticated networks, mainly in the financial sector. They are seeking a high calibre professional with sound banking experience. Knowledge of Tandem equipment would be viewed with extreme interest but otherwise full training will be provided. Ref 0501/N

### IBM GSD

Analysts and Programmers

London/Berks/Surrey £10K upwards

RPG programming skills are required for several vacancies in the locations indicated above. Analysis experience is needed for some posts and at senior levels knowledge of MAAPICS or COPICS could lead to consultancy level appointments for candidates who have led projects and who possess the necessary personal qualities. Ref 0501/P

### Analysts, Prags. & Maths Specialists Senior Operators & Instructors Saudi Arabia - Various Locations

£17 to £30K

Married status and school fees available with some posts for people with 3 to 7 years experience of large IBM mainframes. BANKING, SCIENTIFIC/CONSTRUCTION, COMMERCIAL. Recent involvement with PL-1 TSO/SPF JCL IMS DB/DC Fortran IV MVS/JES2 would be an interest. We also have vacancies for Perkin Elmer 3200 and HP3000 Programmers and Analysts. Ref 0501/A

### Real Time Applications

Surrey Border up to £17K

This systems house is seeking computer professionals capable of responding to a variety of technical challenges. Ambitious Analyst/Programmers with a degree and three years' experience of defence, information or industrial real-time applications would be of great interest. Familiarity with Assembler or real-time/mathematical languages is desirable. Ref 0501/B

### Product Support Specialists

for Micra Systems

Thames Valley & WC1 £12K+

New Products coming from Established Companies seeking experience of IBM PC or Sirius type systems to support their growing Dealer and large OEM customer base. New positions in expanding organisations with great potential for ambitious applicants. Ref 0501/C

### Electronics Engineers

Surrey up to £13.5K

Vacancies exist for candidates with a qualification in electronics and at least two years' software development experience to work on a complex defence systems. Microprocessor and CORAL or PASCAL experience advantageous. Excellent benefits and relocation offered. Ref 0501/D

### Sales Executives

WC1 & Thames Valley

£10K base, £25K OTE + Car

Dealer and OEM sales experience needed with Micra Business Systems or similar products. Emphasis is on knowledge of Dealership networks, including selection and approval, in the Midlands and South. Ref 0501/E

### Finance Consultants/Project Leaders

Surrey Border/London £14-£18K

If you have sound experience of IBM, DEC or Tandem hardware gained within a banking and/or money market and command a strong banking environment, this is an excellent opportunity to make that first move to a top consultancy, or a move to a better one. An out-going personality, coupled with a flexible attitude, is essential. Ref 0501/F

### Maths/Defence Systems

Central and West London £14K

Mathematicians are needed with skills in modelling, simulation, operational analysis or Artificial Intelligence. Defence Project leader experience or capability is required. Both our clients offer excellent career opportunities and relocation if appropriate. Ref 0501/G

### Analyst Programmers

London/Overseas Up to £12.5K

Systems house with world wide client base needs Hewlett Packard experts to work on bespoke versions of complex order processing software. Specification and implementation can be overseas - development in London. A minimum of 3 years experience, at least two on HP3000 is needed for these positions. Ref 0501/H

### Micra S/W Development

Herts £10K + Car

A vacancy exists for an Assembler programmer with a minimum of two years experience to join a software house developing microprocessor based POS products. Well-proven software design skills together with the ability to communicate at all levels is essential. Ref 0501/I

### Systems Designers (S'ware & H'ware)

London, Swindon & Maidenhead £12-£15K

We are looking for candidates with knowledge of Operating Systems including CP/M, MP/M, UNIX and relevant Assembler and high level languages plus LANs. Experience of market requirements, new product design, office technology and communications. Project Leader potential required. Ref 0501/K



Isobel Bruce or David Fletcher 01-405 1006 or write quoting advertisement reference number, 16 Red Lion Square London WC1R 4QS

Recruitment Consultants, Licence No. SE 6789



## HARDWARE TECHNICAL SPECIALISTS

**Have you got the professional know-how to take on one of the top technical support opportunities of 1984?**

Philips Business Systems is looking for experienced technical specialists to join its team of hardware specialists. The successful candidates will have a sound grounding in electronic, computing and electro-mechanical engineering, allied to knowledge of system software, application software and its handling techniques. A relevant qualification, in addition to some field service experience, is the ability to communicate well at all levels, both technically and non-technically.

Based at Colchester, these positions carry attractive salaries and benefits, including an excellent car package.

Applications should be made to Mr. T. H. Hethcote, Senior Personnel Officer, Philips Business Systems, Elstera House, Bergholt Road, Colchester CO4 5BE or telephone him on 0206 575115.

**Product Specialist -**  
Specialist in the repair and maintenance of Philips products.

**Product Specialist -**  
Specialist in the repair and maintenance of Philips products.

These positions are available on a permanent basis. The successful candidates will be responsible for the provision of technical support and advice to customers, the installation and maintenance of Philips products, and the repair and maintenance of Philips products.

For further information, please contact Mr. T. H. Hethcote, Senior Personnel Officer, Philips Business Systems, Elstera House, Bergholt Road, Colchester CO4 5BE or telephone him on 0206 575115.

**Business Systems**

**PHILIPS**

(17080)

## HOWARD

### 1984 Contract Assignments

**System Programmers (2)**  
IBM Assembler, C/C++ Specialist, 4 months, non-union contract, based Brussels, £5200 pw.

**Programmer Analysts (2)**  
IBM, MPE, COBOL, PL/I, 6 months, 3-5 months duration manufacturing, UK, £4500 pw.

**Network Instructor (1)**  
English speaker, to prepare in-house lectures, utilising UK experience together with USA network literature. 10 weeks solid operations exp. with in-depth networking knowledge. Ability to lecture. 1 year contract. European based, to £4000 pw.

**System Programmers (3)**  
One to install IMS, one to provide JES3 expertise, and one VTAM specialist. Contracts for 1 year initially based in West Germany, £15 to £18 per hr neg.

**Analyst/Applications Support (1)**  
Familiar with tech and non tech managers designing, programming within multinational organisations, be aware of latest hardware/software technology, office automation. Background of mainframe, mini and micros useful. Brussels, 1 year, £5000 pw.

**Technical Designers (4)**  
VAX, VMS, UNIX, C, FORTRAN, degree or equivalent exp. hi-tech engineering CAD, CAM, and graphics environment, UK based, 6 months, £ neg.

**Integrated Circuit App. Engineer (1)**  
Engineering background, UK based, Belgian company, self-motivated for custom chip enterprise, to establish UK client base by marketing. £15,000 + car.

**Programmer Analysts (3)**  
Contracts for 1-2 years, N and S England, TANDEM, TAL, essential, finance/banking systems. £6000 pw.

**Integrated Circuit Evaluation Consultant (1)**  
Min. 5 years exp. in area of ATE knowledge of test device parametrization, characterisation and associated data handlers, based Brussels £16-£18 ph contract 1-5 years.

**Software Programmers (2)**  
Support, Modify and enhance ARGUS 700, OSCXX operating systems, UK based, 3-6 months, £ATE.

**Quality Assurance Specialist (1)**  
5 years microelectronics exp., tech leader qualities, able to complete full technical evaluation overseas 15 design engineers. Involved with analysis, reliability and methodology, based in Belgium, one year plus contract. £5000 + pw.

For more information on UK and overseas contracts please telephone Clive Chaffin on 01-952 8092 or write to him at: Howard Organisation International Ltd, Russell House, 140 High Street, Edgeware Middx HA8 7BS.

(7058)

## SOFTWARE ENGINEERS

For a number of years now Interlex has been specialising in the recruitment of personnel for companies who design, develop or use computer based interactive systems in the following areas:—

- Artificial Intelligence
- Networking and Workstation Design
- Defence Systems
- Process Control and Automation
- Image Processing

If you are looking for a new appointment within these areas, then discuss your requirements with Patti Warburg or Clare Newton, our senior consultants on 01-843 0988. Salaries range from £7K to £18K.

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## SYSTEM CONTROLLER

A progressive and exciting local authority which is going places with systems seeks a System Controller who will be responsible for the Project Controller (SOLAP) for the operation of a Prime 750 installation running multi-user site in an essential requirement. Conditions of employment are excellent and relocation assistance will be given if appropriate. For job description plus application form telephone Ray North, Assistant Treasurer (0491) 36381 ext 5811 or write to PO Box 22, Croydon, Surrey CR9 1UH.

## BOX NUMBERS

Box number replies should be addressed to:  
Box Number:  
old Computer Weekly  
The Office  
Bury, Surrey GU8 6AB

## Technical automation jobs in Holland and West-Germany

BSO/Automation Technology is a software house employed mainly in the fields of real-time process control and monitoring systems, simulation techniques, data communications, computer networks, distributed systems, computer graphics and compiler construction.

Our clients range from large international organisations, such as the European Space Agency to small companies, using micro processors for the first time. Our work consists of projects (both in-house and on clients premises) and technical and managerial consultancy.

BSO/AT has 50 employees half of whom are English, and is part of the BSO-group (270 employees), one of the largest in the Netherlands. Vacancies range from:

**programmer to systems designer**  
(to £15,000 and car) (to £18,000 and car)

We are looking for people with 3 to 7 years experience in the design and implementation of real-time industrial or scientific systems on microcomputer or microprocessor systems. Preference will be given to applicants with a good knowledge of one or more assembler languages and at least one of the following high level languages: Pascal, RTLZ, Coral 66, PL/M, Fortran. Applicants who can show in-depth experience of a structured programming methodology will also be given preference.

Applications plus CV as well as requests for information can be directed to our UK representative, Yvonne Waddell, address: BSO/UK, Fivallands, Rockfield Road, Oxford RH8 0EJ, Surrey, telephone: Oxford (01865) 6353 (day and evening). The contact person in Holland is Robert J. J. de Boer, personnel manager.

**BSO** BUREAU VOOR SYSTEEMONTWIKKELING  
Postbus 100, 1000 AA Amsterdam, The Netherlands

(1709)

## CONTRACTS JAN/FEB STARTS

**UNIVAC COBOL - Central London - 6 months.**  
Very interesting project for Analyst/Programmer with DB base and On-Line experience.

**IBM ASSEMBLER Programmer - Surrey - 6 months.**  
Knowledge of PL1 useful.

**ICL SYSTEM 25 ASSEMBLER Programmers, Analysts, grammers, and Designers. Knowledge of Cobol useful.**

**Immediate start - 6 months.**

**Contact MARILYN DAVIDSON or DAVID THOMPSON on 01-836 6775 to ensure the pick of 1984 contracts.**

**Computer Personnel International**  
30-32 Southampton Street, London WC2. 01-836 6775

## DEPUTY DATA PROCESSING MANAGER

**SALARY c. £11,000**

**RICHARD CLAY plc, BUNGAY, SUFFOLK**

The Richard Clay Group is one of the largest book manufacturers in Europe. The company provides a service to a number of Group Companies. An adaptable experienced analyst/programmer is required in the position of Deputy Data Processing Manager in our busy computer department.

In addition to carrying out all aspects of programming, he/she will be involved in system analysis, assessment of software packages and the management of day-to-day computer operations.

Candidates should have three years' RSTS experience in a BASIC PLUS programming environment. Knowledge of CP/M based systems would be an added advantage.

Conditions include:  
Hours of work - 8.30am to 12.30pm and 1.30pm to 5pm five days a week  
Paid holidays - 21 days' in addition to Bank Holidays  
Pension and Life Assurance - Good contributory scheme

For further details and application form, please contact:  
Mr D. A. Peters, Personnel Director  
RICHARD CLAY plc  
Bungay, Suffolk NR35 1ED

# IF YOU'RE STRONGLY MOTIVATED BY STEADY, ROUTINE WORK, LUNCHEON VOUCHERS, SPORTS & SOCIAL CLUB,

## TURN THE PAGE

We certainly don't offer any of the so-called 'perks' which are designed to soften the rungs of an everyday treadmill.

The positions and financial incentives we offer are stimulating and will attract the people who have neither the time nor inclination to worry about where to spend their L.V.'s.

Delta Data Systems is a medium-sized terminal and micro manufacturer that is committed to growth. It is as a result of this commitment that the following opportunities have arisen which will further develop and strengthen our team of high earning professionals.

### PROGRAMMERS

Are you looking for a micro-based assembler programming position offering an excellent salary and a technical challenge? Then come and work on our new Pyramid range of micro systems, built here in the U.K.

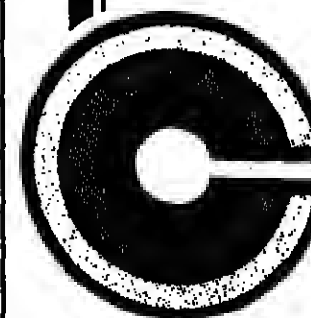
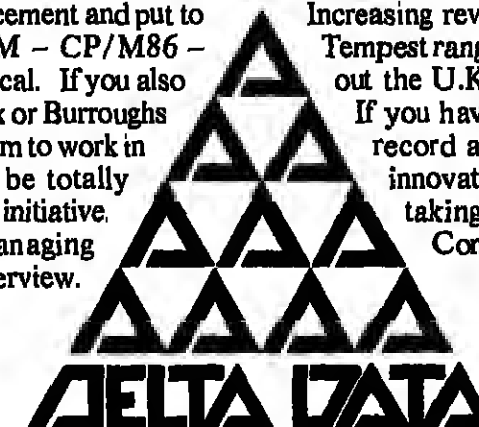
We can match your quest for advancement and put to good use your knowledge of CP/M - CP/M86 - Turbo DOS - Assembler - C or Pascal. If you also have experience of IBM, ICL, Telex or Burroughs communications then we can put them to work in a unique environment which will be totally compatible with your self reliance and initiative. Call Don Whitbread, who is our Managing Consultant, and arrange a local interview.

### SALES EXECUTIVES

Unlike most companies we want to pay you the earth. You could be our most valuable asset, it's all up to you. We offer an aggressive salary, high commission with a realistic target, accelerators and a 2-litre Sierra G.L.

Increasing revenues from the sales of our Pyramid and Tempest ranges to O.E.M. and large end users throughout the U.K. is your passport away from L.V.'s.

If you have a technical background, a proven track record and want to be part of a company where innovation is encouraged and success yours for the taking, call Don Whitbread, our Managing Consultant, and arrange a local interview.



**Computer Career Consultants**

Chiltern House, Oxford Road, Aylesbury, Bucks HP19 3EQ  
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*Johnnie 1214*



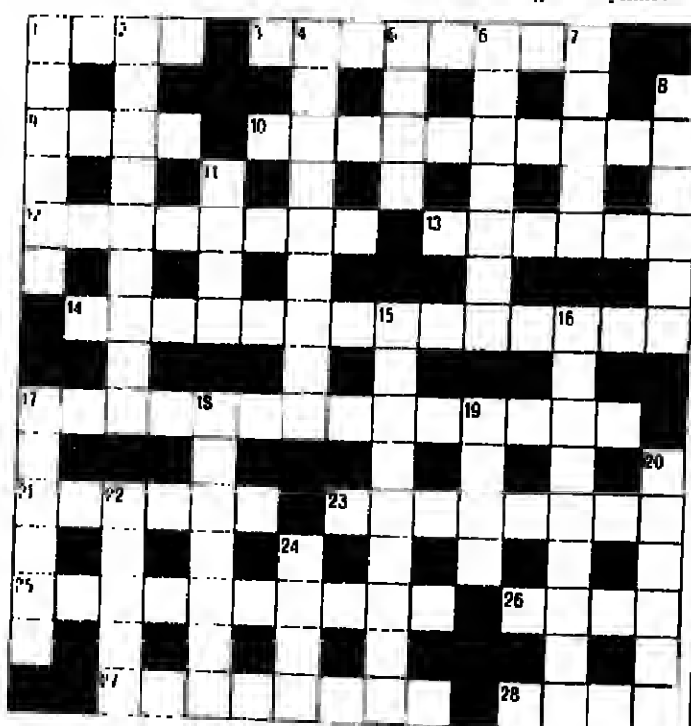




## Prize Crossword No 48

Compiled by Alex Robins

A prize of £10 will be awarded for the first correct entry opened. The second and third solutions opened will receive £5 each. Entries to Crossword Competition, Computer Weekly, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AN, by first post Friday, January 13. Please use a ballpoint to complete the crossword, and include a telephone number at which you can be reached during the daytime.



Name ..... (Miss, Mrs, Ms, Mr)

Address .....

Telephone .....

I accept the rules and conditions of the Computer Weekly Crossword Competition.

Signed ..... Date .....

## ACROSS

- 1 A mess, gathered in with a shawl (4)
- 3 Made progress, being ahead of one's time (8)
- 9 A thick slice, or a thin flat piece (4)
- 10 Rope-sled shoe could even make idlers leap (10)
- 12 With everyone's sweat around one, an association is formed (8)
- 13 Former PM at present reflecting about the Italian Socialists' leader (6)
- 14 Surgical dressings for group a long time in the waves (6-8)
- 17 What's made each January, again, in connection with a clue's answer (1,3,10)
- 21 Giver again in memory about overthrown of wickedness (6)
- 23 Amaze, when turning this on (8)
- 25 Overseer's excellent face protector (10)
- 26 Teller of fairy tales is back in the hat (4)
- 27 Instrument that's pointed at the ship is unnecessary (8)
- 28 Shelf with front cut away is an advantage (4)

## DOWN

- 1 Cavalryman's hospital, one found in Russia (6)
- 2 Kind of dream for tedious little chap? (5-4)
- 4 Turmoil about languages, history, etc. - they contain lots of rubbish (4-5)
- 6,5 Deprived of self-control and removed on a stretcher? (7,4)
- 7 Possibly Kentish youth brought up in the valleys (5)
- 8 Go badly wrong and then catch up? That's all in the game (6)
- 11 Something delivered in an assembly for dancing (4)
- 15 References leading indirectly to Sam's lion (9)
- 16 Exalted idol, going wild with grief (9)
- 17 Stop for a breather, by the sound of it (6)
- 18 Abstracted mental state evident in clergyman on lake (7)
- 19,20 Assumed command to sanction the accusation (4,6)
- 22 Plant that's in a high place, among the heather, mostly (3)
- 24 Start to phone one involved in cover tip (4)

## RULES AND CONDITIONS

1. Each competitor may submit no more than one entry.
2. The competition is open to all readers of Computer Weekly with the exception of the staff of Quadrant Press International Ltd, any printers employed by them or the near relatives of any such staff.
3. The solution of each puzzle will normally be published in the issue three weeks after the puzzle has been published.
4. Winners will receive their prizes during the month following the competition.
5. The decision of the editor on the interpretation of the rules and conditions and on all matters shall be final. No correspondence will be entered into.

## GRADUATE PROGRAMMERS &amp; S/W ENGINEERS

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Superb career opportunities exist for Graduate Programmers and Software Engineers throughout the West Country in both Technical and Commercial environments.

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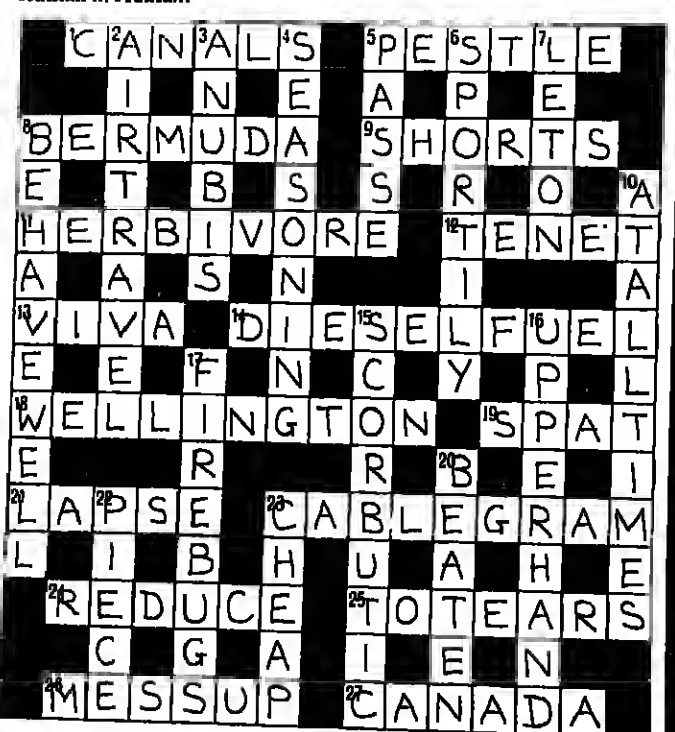
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## Solution to Prize Crossword No 47

The first prize of £10 for last month's crossword goes to Liz Twiss, recruitment manager at CAP in High Holborn, London. Prizes of £5 each are on their way to John Revis, a buyer at Picent in Sandbach, Cheshire, and Norman Law, programmer at Marshalls Halifax in Halifax.



## BUTEL BUSINESS SYSTEMS

Butel Business Systems is a medium-sized Software/Systems House, on target for a £2 million turnover this year. Since our establishment in 1978 we have achieved considerable success in the sale and implementation of turnkey projects and in package development. Now, continuing progress presents a number of excellent career opportunities for true computer professionals.

## Sales Consultants

Target earnings: circa £23,000 + Car + BUPA

We need experienced sales people, or systems people with sales ambitions. You will be selling the full range of Butel products and services, from micro-networks to 32-bit superminis, financial modelling (EPS-FCS) and packaged software covering a wide spectrum of commercial applications. Our suppliers describe us as 'the most sales oriented systems house around', which means you will be encouraged in every way to meet and exceed your targets.

## Systems Consultants/Project Managers

£10,500-£14,000 + Car + BUPA

Experienced System Analyst with proven commercial experience of on line and/or database systems? Experience of project management on at least one significant project? Then there are opportunities for further personal development in an exciting Software House environment, with the latest 32-bit supermini technology, in a wide variety of applications. If you have expertise in DB INFO/DBMS, HP TOTAL/IMAGE, etc., these vacancies will be of special interest.

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£9,500-£12,000 + Car + BUPA

Extend yourself and develop your career as a commercial programmer/analyst. You must have proven commercial COBOL experience, preferably in interactive environments. And you must have a willingness and the ability to deal directly with clients.

## COBOL Programmers

£7,500-£9,500 + BUPA

This is an ideal opportunity for young COBOL programmers (minimum 18 months experience) to enter a fast moving commercial environment. Excellent career development opportunities and the latest software technology.

IMPORTANT - All of the positions advertised will be located West of London. In the first instance write with CV, or telephone, the London Office below.

Sales Vacancies: Andy Miller, Sales Director.  
Technical Vacancies: Ray Sparrow, Systems Director.

## BUTEL

Technology for business

Butel Business Systems,  
Garrick Industrial Centre, Garrick Road,  
London NW9 6AQ. Tel: 01-202 0206.

## UNIVERSITY OF CAMBRIDGE

COMPUTING SERVICE

The Cambridge University Computing Service provides a range of services to the University and its many other academic institutions in the UK. The main facility consists of an IBM 3081 computer in a large user area with a wide range of peripheral services. There is also a smaller IBM 3081 computer in a smaller user area with a wide range of peripheral services. There is also a smaller IBM 3081 computer in a smaller user area with a wide range of peripheral services.

## COMPUTER ENGINEER

To join a team working in the design, construction and maintenance of computers and data communication equipment, look to the Computing Laboratory and its departments of the Department of Engineering and Applied Sciences for a postgraduate degree in computer engineering. The postgraduate degree in computer engineering is a two-year programme leading to a postgraduate diploma in computer engineering. The postgraduate diploma in computer engineering is a two-year programme leading to a postgraduate diploma in computer engineering.

## SYSTEM/34 &amp; /36

## ANALYST/PROGRAMMERS

RSB is a specialist micro and mini software house with a high reputation for good quality commercial software on IBM PC, 23, 34 and 36. We have a number of System/34 and 36 contracts under development some of which involve networked PC communications. We are looking for self-motivated people who have most of the skills listed below.

- \* Solid background in S/34 and GSD.
- \* Experience of commercial systems.
- \* Minimum of two years' RPG II programming.
- \* Systems Design.
- \* Software house experience would be an advantage.

We have vacancies for analyst and programmers to work for specific customers as well as in the product development team. Salaries will be in line with experience and the package of benefits could include a company car. Interested?

Please call Glyn Devlee or Eric Dickinson for an interview (01) 843 1922

RSB COMPUTERS LIMITED  
Wheatfield House, 129-135 Fulwell Road  
Teddington, Middlesex

## MUMPS ANALYST/PROGRAMMERS

HOLLAND

We have a project involving the migration of POP MUMPS Systems to VAX MUMPS and need experienced professionals with at least ten years' experience, six years MUMPS, a knowledge of VAX MUMPS, VMS experience, a knowledge of database methods and experience with dictionary based code generators.

## UNIX AND 'C'

HOLLAND

We have recently started a UNIX division and are seeking specialists in this field. A minimum of three years' programming experience is required with at least one year of C under UNIX. Some practical knowledge of device drivers would be an advantage.

## INTERGRAPH SPECIALISTS

VENEZUELA &amp; EUROPE

Requirements include a good knowledge of INTERGRAPH graphics computers plus VAX and PDP systems. The position would be that of Systems Manager but would require experience on a programmer or user level.

## SCIENTIFIC/TECHNICAL ANALYST/PROGRAMMERS

UK &amp; EUROPE

Experienced personnel are required for a variety of technical projects. Knowledge of the petroleum industry would be an advantage. Please write giving full career history to: Higgins Computer Consultancy S.V., Noesaniun 15, 2514 JT The Hague, Netherlands.

## Computational Mechanics Centre

SOFTWARE ENGINEER c.£8K

Computational Mechanics develops and supports a number of software systems for CAD application. A vacancy exists for an engineer to write and support FORTRAN based computer-aided engineering applications. The successful applicant will be required to have a degree in engineering and experience in FORTRAN programming. A knowledge of Finite Element Elements and graphics would be an advantage.

SALES ENGINEER ODE £17K + CAR

Computational Mechanics is an independent company which specialises in engineering software. The company has an international reputation gained through its innovative approaches to analysis and CAD. The expanding sales of the company has created the need for a sales engineer.

Previous experience of selling FE systems would be an advantage but applicants with a successful record in sales of technical/engineering systems would also be of interest.

As this is a new position, the ODE of £17,000 have been estimated on current levels of sales. The successful candidate is expected to exceed this figure.

Both positions are based at the main offices of the company in the New Forest. The surrounding area provides extensive recreational facilities including beaches and is considered to be one of the country's most desirable areas.

Please reply to:  
Computational Mechanics  
Ashurst Lodge  
Ashurst  
BOUTHAMPTON SO4 2AA  
and enclose c.v.

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COBOL, IBM 30XX, OL/1 or IMS	Programmer/Analysts	Norfolk
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Contract or permanent, we can offer you the range of positions and applications to broaden your technical expertise and enhance your career advancement into project management and beyond. We can also offer you excellent salaries plus the full range of benefits associated with a successful software house, including the opportunity to work on challenging projects throughout the UK, Europe, Middle East and possibly the USA.

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## DATABASE OPPORTUNITIES

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A major U.K. Finance House based near Covent Garden is currently undertaking several significant projects using the latest Database development techniques. To ensure that these are successful, they are now looking for an able D.P. professional who wishes to develop a career in database design and support.

You will be working in a small Data Administration group that supports development project teams, providing expertise on Data Analysis and Database Design and subsequently performance monitoring and tuning. The main database software is IMS/DB with CICS under MVS. It is intended to acquire an MIS/DSS database product in the near future.

Probably in your mid 20's you will have had 2/3 years experience in either a database support group or in programming with database driven applications. Salary is negotiable according to age and experience and will be accompanied by a generous benefits package which includes Non Contributory Pension, Group BUPA scheme, subsidised restaurant, and after a qualifying period season ticket, loan and mortgage facilities.

Call David Mason Johns TODAY on 01-848 5922

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Cobden House, Park Lane,  
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## SALES BIT

Quality of Management - 77

## It pays to get out and about with the troops

FIRST of all, I would like to wish you a happy and successful New Year in all your selling endeavours.

For most salespeople, January 1 marks the beginning of another selling year and once again, the realisation that they are no more than yesterday's heroes, starting out at the same level as the rest of the team.

Last year may have brought financial and material rewards for outstanding achievements, even a plethora of those dreadful plastic plaques for achievement beyond the call of duty, but the selling year has completed another cycle and everyone is back on the same level with everything yet to be achieved.

This is also the time of year when salespeople contact companies like mine in order to review the possibility of changing employment. For most, their motivation will be failure. Pressure from their superiors, or their pocket, or both, will have persuaded them to move on. Of these, most will have failed because they are simply not cut out for the selling profession.

Possibly they have enjoyed some success because they spent some

wide array of practical benefits, it has the advantage of incurring no external costs.

The business of making real life sales calls, then counselling and appraising the outcome is a much more dynamic process than the classroom situation, and much more likely to bring about immediate results.

One is dealing with the salesman in his natural habitat, his territory, his customers, his problems, rather than an artificial situation that has been dreamed up by a sales trainer and may be totally irrelevant.

Of course, there are always plenty of excuses to be found when a sales manager is asked why he never gets out and about with the troops, to involve them in training exercise.

- "I've tried, but it doesn't work."
- "I find it too difficult."
- "I don't have the time."
- "I've more important things to do."
- "There's no need, we only employ experienced salespeople."
- "My salesmen aren't very keen, it puts them off."

One important thing to remember about field training is that it should not be limited to trainees and the less experienced salespeople. Even those successful salesmen who have been with you for many years can still get something out of a day on territory with his boss

time in a seller's market only to fail when it was necessary to sell, rather than simply allowing customers to buy from them.

Sadly, most of these people will obtain selling jobs somewhere simply because the industry is so desperately short of salespeople and most employers have insufficient experience and perception of people to discern the good from the bad, and from the indifferent.

I suppose it is reasonable to say that many of these failed salesmen have had the odds of sales success stacked against them, because they have had little or no selling training. Most of the things they do wrong are because they have never been taught any different.

My company is in the sales training business as well as recruitment, so we are more aware than most that only a small proportion of computer companies get involved in training their people in how to sell.

As a recruitment firm, we deal with well over 200 companies, which include virtually all the major suppliers, and I doubt if more than 10% provide sales training of any kind. What an indictment of the computer industry!

For many, the excuse is that they have no budget for the expenditure. That doesn't say much for their budgeting, their influence upon their superiors or their perception of sales management.

In particular, it makes one wonder if they have ever heard of field training. No, it's nothing to do with farming; it is the invaluable process of accompanying the salesman during his normal selling activity and using each call as a training exercise. In addition to a

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## PUZZLE ANSWER

THE hidden sequence was 246315. This conclusion may be arrived at as follows:  
Designate the five replies A, B, C, D and E. Now, from B eliminate 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371,